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FINAL

ENVIRONMENTAL IMPACT STATEMENT

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PROPOSED OCS OIL AND GAS SALES

67 and 69

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DEPARTMENT OF THE INTERIOR / BUREAU OF LAND MANAGEMENT

UNITED STATES DEPARTMENT OF THE INTERIOR
JAMES G. WATT, SECRETARY

BUREAU OF LAND MANAGEMENT
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NEW ORLEANS OUTER CONTINENTAL SHELF OFFICE
HALE BOGGS FEDERAL BUILDING, NEW ORLEANS, LA 70130

ERRATA SHEET - FEIS SALES 67/69

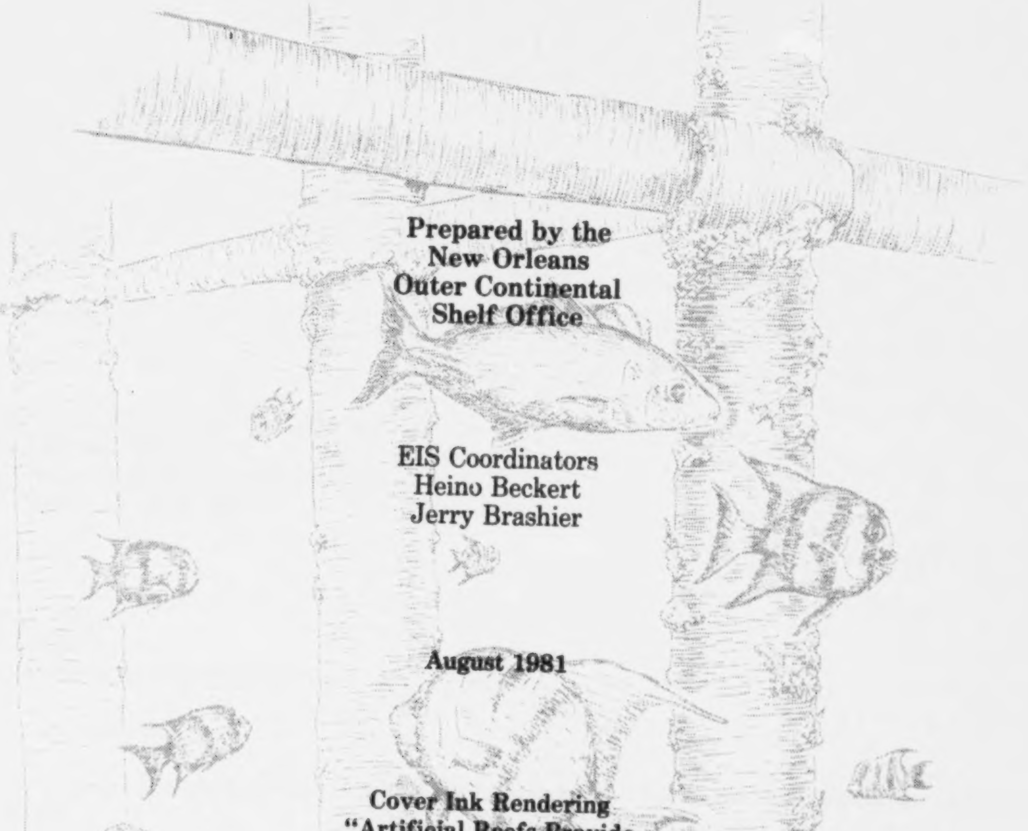
Page 30, line 2. Change sentence to read: (To apply to lease tracts 67-176 through 67-223 and 69-159 through 69-247.)

FINAL

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED OCS OIL AND GAS SALES

67 and 69



Prepared by the
New Orleans
Outer Continental
Shelf Office

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Heino Beckert
Jerry Brashier

August 1981

Cover Ink Rendering
"Artificial Reefs Provide
Ideal Marine Habitats"
By Robert Rogers

Additional copies may be obtained by contacting:
The New Orleans OCS Office, Hale Boggs Federal Building, New Orleans, LA 70130
or
The NTIS, U.S. Department of Commerce, Springfield, VA 22161

Summary

1. Preliminary Information

Proposed OCS Oil and Gas Lease Sales 67 and 69

Draft ( ) Final (X) Environmental Impact Statement

Type of Action:

Administrative (X) Legislative ( )

Lead Agency:

United States Department of the Interior
Bureau of Land Management
New Orleans Outer Continental Shelf Office
New Orleans, Louisiana 70130

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Area of Project Impact:

Federal Offshore Marine Environment, Coastal Counties/Parishes of Texas, Louisiana, Mississippi, Alabama, and Florida

2. Description of Area and Proposed Action

Proposed OCS Sales 67 and 69 are scheduled for March and August 1982, respectively, in accordance with the Department of the Interior's Final 5-Year OCS Oil and Gas Leasing Schedule (June 1980). This EIS covers both sales due to the geographical and chronological proximity of the sales to each other. Appendices to the DEIS are not being reprinted for this FEIS, except Appendix A, Proposed Tract List. Appendix D, of the DEIS, Oil Spill Risk Analysis, is available as Open File Report 81-306 from the U.S. Geological Survey, Box 25425, Federal Center, Denver, Colorado 80225. All other appendices are available, upon request, from the New Orlean OCS Office.

The two Gulf of Mexico proposed lease sales consist of approximately 2,458,827 acres (1,170,456 acres for Sale 67 and 1,288,371 for Sale 69) in 472 tracts offshore Texas, Louisiana, Mississippi, Alabama, and Florida. Of these tracts, 225 tracts comprise Sale 67, and 247 tracts comprise Sale 69. The tracts are from 3-140 nautical miles (nmi) offshore and in water depths from 2-2,400 meters (m) (Appendix A).

Oil and gas resource estimates from the U.S. Geological Survey (USGS) for Sales 67 and 69 follow:

Oil (million barrels)	Low	Mean	High
Sale 67	30.20	50.56	162.47
Sale 69	18.07	26.63	37.88
Gas (billion cubic feet)			
Sale 67	512.08	912.57	2113.49
Sale 69	403.97	614.06	826.90

For the purpose of this EIS, the mean production values are used. The combined mean estimates for both sales indicate that 225 exploration wells and 220 development wells will be required, 285 miles of offshore pipelines constructed, and 30 new platforms installed. The combined cost is estimated to be $3.27 billion. The combined mean daily peak production from the sales is estimated at 31,000 barrels of oil per day and 633 million cubic feet of gas per day.

Basic assumptions for impact estimates and analysis of potential environmental consequences are presented in Section IV.B. In the area of transportation, the mean resource estimate development scenarios assume that production offshore Texas and Louisiana will be transported to shore by connecting to existing trunk pipelines. Production in the Upper Gulf area (Mississippi-Alabama-Florida "panhandle") will be connected by new pipelines to existing trunk pipelines for transportation to existing processing facilities in Mississippi. Production in the Florida Shelf offshore development area will be gathered by new pipelines to a central point for storage/transfer to shuttle tankers for shipment to existing processing facilities in Texas, Louisiana, or Mississippi.

In the area of cumulative transportation impacts, it is assumed that gas or oil production offshore Texas or Louisiana, respectively, could contribute to construction of a new gas trunk pipeline with landfall along the Texas coast or construction of one or more additional oil trunk pipelines with landfall along the Louisiana coast. Production in the Upper Gulf area could contribute to eventual construction of a new trunk pipeline with landfall in Mississippi or Alabama, and production on the Florida Shelf could contribute to construction of a new trunk pipeline with landfall along the west coast of Florida. Further, it is assumed that existing onshore facilities will be used with little or no expansion attributable to the proposed sales. Tracts offshore Texas and Louisiana will utilize existing service bases in Texas and Louisiana, respectively, and tracts on the Florida Shelf will use existing or expanded Port Manatee facilities. Tracts in the Upper Gulf area will use existing, expanded, or new service base facilities in Jackson County, Mississippi, and/or Mobile County, Alabama.

Holding the sales as proposed will provide for a continuation of oil/gas exploration activities in the Gulf of Mexico OCS. This could provide the production indicated above. This is judged to be a gain for the nation from both a standpoint of energy needs and the economic and political goals of independence from energy imports.

3. Issues and Areas of Concern

Coordination with Other Agencies

As authorized by the Outer Continental Shelf Lands Act (OCSLA), as amended, the Bureau of Land Management (BLM) and USGS serve as the primary federal agencies administering these sales and coordinate with one another throughout the prelease processes and production phases. In addition, as lead agency, BLM coordinated as appropriate with many outside cooperating federal and state agencies and nongovernmental groups and organizations in order to obtain resource data in their areas of expertise and to aid in the identification of major issues and concerns.

Determination of Public Issues and Areas of Concern

In order to fulfill OCSLA and the Council on Environmental Quality (CEQ) requirements and regulations to involve others in OCS planning and decisionmaking, BLM followed a set of procedures for contacting and coordinating with federal, state, and local governments; institutions; public interest groups; and concerned individuals. Resource reports were requested by BLM from other federal agencies having the appropriate expertise to meet the information needs. State agency data were often used by federal agencies in their responses. State representatives of the Gulf of Mexico Regional Technical Working Group were also contacted by BLM. Environmental concerns were requested in the Call for Nominations and subsequently considered during tract selection. Special opportunities for the expression of environmental issues and concerns were given to the general public through printed and electronics media.

The scoping activities for Sales 67 and 69 identified a number of potential environmental concerns. The assessment for each of these was summarized and briefly discussed in Appendix B of the DEIS. Four major or significant areas of environmental concern were identified as the issues to be analyzed in depth in this environmental impact statement (EIS) (Sections II.A.2. and IV.D.1.):

Biologically Sensitive Areas
Florida Manatee
Recreational Fishing
Coastal and Marine Birds

4. Major Alternatives

Major courses of action follow, and a comparison of the alternatives is discussed in Section II.F.:

- Alternative A (Hold the Sales as Proposed)

- Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas): Of the 126 biologically sensitive tracts, 107 (live bottom areas) are located in the eastern Gulf (east of the Mississippi River Delta); 30 of these tracts are from 3-20 miles south of the Mississippi/Alabama coast and 77 are situated more than 60 miles seaward of the Tampa Bay/Charlotte Harbor areas. The remaining 19 tracts are known prominent topographic features associated with the continental shelf break off Texas and Louisiana.

- Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters): These scattered tracts range from 35-140 nmi offshore Texas and Louisiana.

- Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts): These tracts are from 3-9 nmi off the coasts of Mississippi and Alabama and as close as 3 miles to the shoreline of the Gulf Islands National Seashore; they are included in Alternative B-1.

- Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks): They are included in Alternative B-1.

- Alternative C (Delay the Sales)

- Alternative D (Withdraw the Sales - No Action)

- Alternative E (Reoffering of Tracts from Sales A66 and 66)

Summary of Environmental Consequences

a. Summary of Impacts Relating to Alternative A (Hold the Sales as Proposed)

- Risk of Oil Spill Impact: The expected number of oil spills greater than 1,000 barrels occurring during the average production life of the leases (13 years) is .37 (Appendix D of the DEIS, Table 1). The expected number of oil spills occurring and contacting land within a 30-day period over the production life of the lease area is .2 (Appendix D of the DEIS, Table 11). As a result of Sales 67 and 69, the probability of one or more spills occurring and contacting land within 30 days over the production life of the lease area is 19% (Appendix D of the DEIS, Table 11).

- Biologically Sensitive Areas: Oil and gas exploration and development activities have the potential for causing severe harm to productive and unique biological communities through mechanical damage or from drilling effluents or disturbed sediments. Stipulations have been developed to protect these communities so that impacts resulting from this proposal are considered to be localized and short-term in nature (Section I.C.2.b.).

- Florida Manatee: The Florida manatee is an endangered species that could be adversely impacted by an oil spill or injured or killed by collisions with offshore service vessels. However, it is unlikely that this will occur (less than 0.5% probability of an oil spill occurrence); therefore, the manatee is not expected to be impacted by this proposal (Appendix E of the DEIS).

- Recreational Fishing: This proposal is expected to enhance recreational fishing by stimulating the development of approximately 30 new platforms which will function as artificial reefs attracting fish and fishermen.

- Coastal and Marine Birds: Coastal and marine birds are vulnerable to oil spills, especially birds that dive into the water to feed and those that roost on the water's surface. However, since it is unlikely that an oil spill will occur (less than 0.5% probability), coastal and marine birds are not expected to be adversely impacted. Also, new onshore facility construction could adversely impact coastal birds and their habitats, but this is expected to be negligible since any new onshore facility construction is expected to be located in existing developed areas.

- Cumulative Impacts of OCS Sales 67 and 69: Use of the OCS region of the Gulf of Mexico for oil and gas development has a 30-year history. During that period of time, there has been no documentation that these activities have had a significant adverse impact on the environment; therefore, cumulative impacts for all environmental resource categories are expected to be negligible to low.

b. Summary of Impacts Relating to Alternatives B-1, B-2, B-3, and B-4 (Modify the Proposal via Tract Deletions)

- Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas): Deletion of these tracts would eliminate about 27% of the total number of tracts included in Alternative A (Hold the Sales as Proposed). This would reduce the total estimated oil and gas resources and other associated benefits of the sales by a significant amount, but all impacts that could result from development of these tracts would be prevented.

- Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters): Deletion of these tracts would eliminate about 13% of the proposed tracts and could reduce the total sales-related benefits by a significant amount. Elimination of these tracts would, however, prevent the short-term impacts on the biota from occurring, such as those from operational disturbance and resuspension of bottom sediments.

- Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts): Deletion of these tracts would eliminate about 4% of the proposed tracts. This deletion would eliminate the major operational activities visual impacts on recreational use at the Mississippi/Alabama barrier islands, including the Gulf Islands National Seashore.

- Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks): Deletion of these two tracts would eliminate .42% of the total tracts in the two sales of this proposal. This would eliminate the potential for impact to the Flower Garden Banks as a result of these proposed sales and would avoid conflicts in these two tracts with the proposed Flower Garden Banks Marine Sanctuary; however, other blocks near the Banks and within the proposed sanctuary are leased and are currently undergoing exploration and development. Stipulations which would be applied to the two tracts of this proposal, like those applied to the blocks already leased, would protect the unique and valuable living resources of the Banks from damage due to oil and gas activities.

c. Summary of Impacts Relating to Alternative C (Delay the Sales)

Holding the proposed sales at a later date would postpone any adverse impacts.

d. Summary of Impacts Relating to Alternative D (Withdraw the Sales - No Action)

Withdrawal of the sales would preclude all potential and expected environmental impacts of the proposed sales, as well as those of Alternatives B and E.

e. Summary of Impacts Relating to Alternative E (Reoffering of Tracts from Sales A66 and 66)

Since tracts for this alternative are unknown at the present time, the environmental consequences will be analyzed when the tracts are identified; however, when these tracts were discussed in the FEIS for Sales A66 and 66, no significant impacts were found.

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Abbreviations

AIM	Airman's Information Manual
APD	Application for Permit to Drill
AQCR	Air Quality Control Region
BAST	Best Available and Safest Technology
BC	Bureau of the Census
BLM	Bureau of Land Management
BOD	Biochemical Oxygen Demand
BOF	Buccaneer Oil Field
BP	before present
Btu	British thermal unit
CEI	Coastal Environments, Inc.
CEIP	Coastal Energy Impact Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGA	Clean Gulf Associates
CNA	Center for Natural Areas
CZMA	Coastal Zone Management Act
DCM	Deputy Conservation Manager, USGS, Conservation Division
DEIS	Draft Environmental Impact Statement
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI (also: USDI)	U.S. Department of the Interior
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAR	Federal Aviation Regulations
FCMA	Fishery Conservation and Management Act
FCZ	Fishery Conservation Zone
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FMC	Fishery Management Council
FMP	Fishery Management Plan
FR	Federal Register
FWPCA	Federal Water Pollution Control Act
FWS	U.S. Fish and Wildlife Service

GIPSY	General Information Processing System
GOM	Gulf of Mexico
GS (also: USGS)	U.S. Geological Survey
GSA	General Services Administration
HCRS	Heritage Conservation and Recreation Service
ICC	Interstate Commerce Commission
IGFA	International Game Fish Association
IPP	Intergovernmental Planning Program
LOOP	Louisiana Offshore Oil Port, Inc.
LWCF	Land and Water Conservation Fund
MAFLA	Mississippi, Alabama, Florida
MMA	Marine Mammal Act
MOU	Memorandum of Understanding
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NGPA	Natural Gas Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Survey
NPDES	National Pollutant Discharge Elimination System
NTL	Notice to Lessees
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OCSLAA	Outer Continental Shelf Lands Act Amendments
OCZM	Office of Coastal Zone Management
PAH	Polynuclear Aromatic Hydrocarbon
PARS	Port Access Route Study
PDEIS	Preliminary Draft Environmental Impact Statement
PIRS	Pollution Incident Reporting System
PL	Public Law
RTWG	Regional Technical Working Group
SAB	South Atlantic Bight
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCUBA	Self Contained Underwater Breathing Apparatus
SIC	Standard Industrial Classification
SID	Secretarial Issue Document
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SUSIO	State University System Institute of Oceanography
TSP	Total Suspended Particles
ULCC	Ultra Large Crude Carrier
USDC	U.S. Department of Commerce
USDI (also: DOI)	U.S. Department of the Interior
USGS (also: GS)	U.S. Geological Survey
UTM	Universal Transverse Mercator
VLCC	Very Large Crude Carrier
VOC	Volatile Organic Compound

Section I

The Proposal

I

I. THE PROPOSAL

A. Introduction

Current energy demands are met primarily by domestic and foreign fossil fuels, but continued dependence on foreign imports will heighten the inherent problems with that supply. The stoppage of oil exports from Iran as a result of that country's political upheaval underscores our vulnerability and dependence on imported oil from all foreign sources. The President's Energy Message of April 5, 1979, reflected that fact and stressed the need for increasing our own resource production to gain independence from foreign oil. He set a primary goal for 1990 that our nation import only one-half of the current rates. Development of OCS resources will have a positive impact on domestic production and aid in accomplishing the President's goal. To achieve energy independence, domestic petroleum production or alternative energy sources must be substituted for foreign oil imports. The outer continental shelf (OCS) is an area where the federal government can have a positive impact on domestic production. By holding lease sales of OCS lands, the government can encourage domestic exploration, development, and production of oil and gas. This goal is stated in a Department of the Interior (DOI) news release dated March 9, 1979, entitled "Draft Proposed Five-Year OCS Schedule Submitted to Governors." All these goals are delineated in Public Law 95-372, Amendments to the Outer Continental Shelf Lands Act (OCSLA). These amendments serve to establish a policy for the management of oil and natural gas on the OCS. Therefore, Congress, the President, and the Department of the Interior have made oil and gas leasing an important governmental process and means of reducing dependence on foreign oil. Toward this purpose, the proposed sales could provide 77.19 million barrels of oil (mean resource estimate) and 1,526.63 billion cubic feet of gas.

The CEQ regulations require that an EIS be prepared prior to a significant federal action as an aid in agency planning and decisionmaking. It also requires that alternative actions be considered. Besides the proposal to hold the sale, seven other alternatives were addressed; i.e., four potential tract deletion alternatives, delay the sales, no action (Withdraw the Sales), and reoffering of tracts from Sales A66 and 66. This DEIS will, therefore, address the range and scope of actions, alternatives, and impacts to be considered relative to these proposed sales. All potential impacts were analyzed and resulted in four being deemed significant enough to be addressed in the statement—biologically sensitive areas, Florida manatee, recreational fishing, and coastal and marine birds. The remainder are included in Appendix B of the DEIS, Summary Impact Assessment, available at the New Orleans OCS Office.

This statement deals only with the Gulf of Mexico area; however, national implications for all OCS sales have been discussed in an EIS covering the Five-Year OCS Oil and Gas Lease Sale Schedule, published in June 1980, of which these sales were a part.

B. Scoping Process

The scoping process followed by BLM in developing this OCS environmental impact statement actually encompasses consideration of environmental issues and alternatives at many points in the early planning of a sale. The following different activities and occasions of public dialog begin the process of defining the design. The last step in that process is an internal scoping meeting (or meetings) following which all previous data, problem considerations, written input, and direct contact discussion is reviewed and analyzed for its synthesis into an EIS covering only the most important issues and alternatives. These steps are outlined below.

Throughout the federal OCS leasing process, BLM follows a set of procedures for contacting and coordinating with federal, state, and local governments; institutions; public interest groups; and concerned individuals, in order to fulfill the OCSLA requirements and CEQ regulations to involve others in the planning and decisionmaking process of any federal OCS action (Section I.D.).

The following is a general discussion of the procedures implemented for each step in the leasing process for the proposed sales. Where applicable, a specific discussion is included for these proposed sales:

1. Resource Reports: These technical reports are requested by BLM from other federal agencies with expertise appropriate to the needs of information about such disciplines as geology, coastal zone management, sport and commercial fishing, and recreation use. Contact is also made with State Historic Preservation Officers (SHPO)

from all affected coastal states requesting information on National Register properties, as well as eligible properties, in compliance with Section 106 of the National Historic Preservation Act and CFR 800. Although resource reports are not requested from other state agencies, data obtained from the various agencies are used by federal agencies in their responses to BLM. Contacts with state representatives are made.

For this proposal, numerous informal contacts were made with many individuals representing several state agencies. Such contacts were intensified during the preparation of the resource descriptions for the environmental briefing for tract selection.

2. Call for Nominations and Comments: Copies of the Call for Nominations are prepared in BLM's Washington Office and sent to the governor of each affected state two or three days prior to the publication of the Call notice in the *Federal Register*.

The Call for Nominations was issued and published in the *Federal Register* of January 23, 1980 (45 FR 5405) as corrected in 45 FR 7317 (February 1, 1980), as amended in 45 FR 8730 (February 8, 1980), with a closing date of March 14, 1980, identifying a broad potential lease area in the Gulf of Mexico from Texas to Florida. It also requested nominations (including negative nominations) and comments from industry, governmental agencies, academia, private citizens, and environmental groups regarding tracts within the sale areas. Blocks with the greatest potential for oil and gas were identified as well as areas of environmental concern. In response, 32 companies nominated 2,059 blocks totaling approximately 11.2 million acres. From these, 225 tracts totaling approximately 1,170,456 acres were selected for Sale 67 and 247 tracts totaling approximately 1,288,371 acres were selected for Sale 69 for a total of 472 tracts comprising approximately 2,458,827 acres.

3. Tract Selection: Prior to the closing deadline for receipt of nominations and comments, the affected states are contacted by the OCS Manager with a request that a governor's representative attend the environmental briefing and tract selection meetings. Each state is offered the opportunity to comment on matters of concern relating to offshore, nearshore, or onshore sensitivity. To assist the states in preparing for OCS participation, maps indicating industry interest areas are sent to the governor.

In regard to the tract selection process for these proposed sales, state representatives were invited to attend two formal coordination meetings at the New Orleans OCS Office. At the April 1, 1980 meeting, there were four representatives from four states, six federal agency representatives, and six representatives from industry and the private sector; the April 16, 1980, meeting was attended by five state representatives, seven federal agency representatives, and four representatives from industry and the private sector.

Based on the procedures described above, 2,458,827 acres were recommended for these proposed sales. A Notice of Intent to prepare a combined environmental impact statement for proposed Sales 67 and 69 was published in the *Federal Register* of July 31, 1980 (45 FR 50941). USGS was then requested to provide resource estimates as well as development timetables and estimates.

4. Tentative Announcement of Tracts: The Director informs the respective governor(s) of the forthcoming tract selection announcement by telegram which is then followed by mailing copies of the tentative tract list and press release. The OCS Manager informs each state representative by telephone of any significant changes which have occurred to the tract lists. On June 2, 1980, the tracts for these proposed sales were announced to the public and are listed in Appendix A.

5. Section 7 of the Endangered Species Act: This section requires formal consultation between BLM, USGS, National Marine Fisheries Service (NMFS), and Fish and Wildlife Service (FWS) about any endangered species which may be affected by this proposal. Section 7 consultation was held on February 6-9, 1979.

6. Stipulation Meetings: Oil and gas exploration and development activities have the potential for causing negative environmental impacts (Section IV.C.); therefore, stipulations are attached as an additional mitigating measure to any lease on a tract considered to have potential for such harm. Two stipulation meetings were held for these proposed sales on June 12, 1980 and August 26, 1980. As a result of these meetings, stipulations were formulated covering archaeology, biology, military areas, geology, and pipeline transportation (Section I.C.2.).

7. Oil Spill Model: These models are developed by USGS for the purpose of predicting probabilities for oil spill occurrence in the proposed area. This information is developed as an aid in assessing the potential environmental impacts which could occur as a result of an oil spill (Section IV.C.1.).

8. Public Scoping: Special attention was given to the general public by the use of printed and electronic media relations. Twelve hundred special media releases were distributed to stimulate public attention and afford citizens the opportunity to submit their environmental issues and concerns

Legal notices, news releases, and site-specific maps were placed in area newspapers which outlined detailed information about proposed OCS Sales 67 and 69. Areawide radio, network television, and public television in coastal cities and surrounding areas were mailed special information sheets and maps with a request to publicize them. The public was invited to direct all comments to the New Orleans OCS Office.

Several areas of concern were considered after careful review of the readily identifiable input as a direct result of sale related concerns as well as careful analysis of regional trends resulting from 25 years of leasing and development. After further agency coordination and internal evaluation, only four significant issues were identified as major environmental concerns about which the EIS should be developed: biologically sensitive areas, the Florida manatee, recreational fishing, and coastal and marine birds. The four significant issues (biologically sensitive areas, Florida manatee, recreational fishing, and coastal and marine birds) are discussed in Sections II.A.2. and IV.D.1. Appendix B of the DEIS, which is available from the New Orleans OCS Office, is the Summary Impact Assessment in which all other impacts and concerns are analyzed and summarized.

Oil and gas activity near biologically sensitive areas is of great concern to some agencies and public interest groups because of the potential for such activities to harm the biota. Certainly such potential is there, but it is the belief of DOI that the stipulations described in Section I.C.2. serve to reduce that potential to an insignificant level. However, the concern persists despite the evidence that oil and gas operations can be carried out near these areas in an environmentally acceptable manner provided by the stipulations. Because of this concern, a deletion option, Alternative B-1 (Section II.B.1.), is discussed.

The Florida manatee presents a specific, significant issue as a designated species under the Endangered Species Act of 1973, as amended. The manatee's habitat includes areas of coastal southwestern Florida which could receive increased support traffic from oil and gas activities.

A new type of recreational fishing has evolved in the central and western Gulf of Mexico as a direct result of 25 years of leasing and development. This activity, known as "rig fishing," affects a large and growing population of marine anglers and their support industries (boat and equipment manufacturers and retailers, marinas, and charter boat enterprises); consequently, this can cause significant influence on the entire coastal zone. The public, as well as public administrators, coastal planners, and fishery managers, needs to realize and understand the biological, social, and economic impact offshore oil and gas development can have on the recreational fishing industry.

Coastal and marine birds are considered a significant issue since they may be adversely affected should an oil spill occur in the area of the proposed lease sales. Of particular concern is the brown pelican, an endangered species.

9. Draft Environmental Impact Statement (DEIS): The Department has committed itself to prepare site-specific draft environmental impact statements on each proposed OCS lease sale, in addition to the programmatic EIS which was published and made available to the public in June 1980 (USDI, 1980b), supplemented on June 5, 1981.

Once the tract selection is completed and the area for a proposed lease sale defined, BLM prepares a DEIS in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA). This DEIS is submitted to the Environmental Protection Agency (EPA) and made available for public review and comment.

10. Public Hearings: Opportunity for state participation in the OCS public hearings is routinely provided by BLM. Specific dates and locations are announced in the *Federal Register* when the DEIS is issued. Public hearings are conducted during a 45-day review and comment period. The public hearing for Sales 67 and 69 was held in April 1981, the last day for accepting comments was May 20, 1981.

11. Final Environmental Impact Statement (FEIS): All comments received in conjunction with the DEIS and the public hearings will be considered in preparing the FEIS which is scheduled for release in August 1981. Formal distribution of the FEIS is made to EPA, the states, depository libraries, and general public.

12. Secretarial Issue Document (SID): Concurrently with the preparation of the FEIS, a SID presenting the significant issues and identifying the alternative actions is developed for use by the Secretary of the Interior. The SID brings all factors associated with the proposed action to the decisionmaker's attention. These include environmental and physical factors, and other issues, including potential economic and social impacts of the proposal and its effect on DOI's program. The SID and FEIS provide the necessary information to the Secretary of the Interior to make a decision on various sale options, including whether or not to hold a sale.

13. Notice of Sale: If a decision to hold the sale is made by the Secretary, the Manager will contact the governor of each affected state and provide him with copies of the Proposed and Final Notices of Sale prior to their publication in the *Federal Register* (43 CFR 3315.2).

14. Proposed and Final Notices of Sale: If a decision is made to proceed with the sale, BLM prepares a notice for publication in the *Federal Register*, which includes information on sale procedures and the method(s) of bidding which is designed by DOI and DOE. A copy is sent to the governors of the affected states for a 60-day review and submission of any comments or recommendations on the size, timing, or location of the proposed sales. After this 60-day period a final decision is made regarding method of bidding, lease stipulations, and all terms and conditions of the sale. A final notice is prepared and reviewed principally by FWS, USGS, and DOE.

15. Lease Sale: Sealed industry bids for individual tracts are opened and read at the lease sale. After an assessment is made by BLM, USGS, and the Department of Justice, leases may be awarded to the highest, qualified bidders. The Secretary reserves the right to withdraw tracts from consideration for the sale, as well as reject bids received. Proposed Sale 67 is tentatively scheduled for March 1982 and proposed Sale 69 is tentatively scheduled for August 1982.

There are approximately two years between the Call for Nominations and the actual lease sale.

C. Description of the Proposal

1. Location and Resources

Proposed Sales 67 and 69 will offer a total of 472 tracts containing approximately 2,458,827 acres in federal waters offshore Texas, Louisiana, Mississippi, Alabama, and Florida. These tracts range from approximately 3-140 nmi offshore in water depths of approximately 2-2,400 m. Individual tract locations are shown on Visual 1 overlay; tract data are listed in Appendix A.

The resource estimates listed in the Summary (p. ii) are conditional and their estimated probabilities apply only to the tentative sale area as a whole. There is an additional geologic risk for the occurrence of hydrocarbons within any given structure.

The development assumptions and scenarios for this proposal are discussed in Sections IV.A. and B. The effects of the high resource scenario are discussed in Section IV.D.3.

2. Mitigation Via Lease Stipulations

Oil and gas exploration and development activities on the OCS have the potential for causing negative environmental impacts; therefore, stipulations are attached as necessary in the form of additional mitigating measures to those already in place. Different types of stipulations can be attached, but for this proposal five stipulations are recommended. They are the archaeological, biological, geological, military area, and pipeline transportation stipulations. They apply only to tracts considered to have the potential for such harm.

USGS is responsible for insuring that stipulations appended to leases are fully complied with. Under the provisions of Departmental Manual Release, 655 DM 1, formerly known as the Secretary of Interior's Secretarial Order No. 2974. USGS consults with BLM and FWS regarding each industry Plan of Exploration, Plan of Development, and pipeline application. BLM and FWS review these documents thoroughly to ensure that stipulations are complied with and make recommendations to USGS regarding stipulations and other matters under this purview. 655 DM 1 also provides for consultation among BLM, USGS, FWS, National Park Service, and Heritage Conservation and Recreation Service regarding other matters of mutual interest on the OCS, such as development of environmental studies, tract selection, development of stipulations, OCS Orders, NTL's, and other matters of particular interest to one of these agencies. These procedures have been in place and operating efficiently and effectively for more than five years.

a. Archaeological Stipulation

The archaeological stipulation given below has been developed as a protective measure for the cultural resources which may exist on the OCS:

> If the Deputy Conservation Manager (DCM), having reason to believe that a site, structure, or object of historical or archaeological significance, hereinafter referred to as "cultural resource," may exist in the lease area, gives the lessee written notice that the lessor is invoking the provisions of this stipulation, the lessee shall upon receipt of such notice comply with the following requirements:
>
> Prior to any drilling activity or the construction or placement of any structure for exploration or development on the lease, including but not limited to, well drilling and pipeline and platform placement, hereinafter in this stipulation referred to as "operation," the lessee shall conduct remote sensing surveys to determine the potential existence of any cultural resource that may be affected by such operations. All data produced by such remote sensing surveys as well as other pertinent natural and cultural environmental data shall be examined by a qualified marine survey archaeologist to determine if indications are present suggesting the existence of a cultural resource that may be adversely affected by any lease operation. A report of this survey and assessment prepared by the marine survey archaeologist shall be submitted by the lessee to the DCM and to the Manager, BLM OCS office for review.
>
> If such cultural resource indicators are present, the lessee shall: (1) locate the site of such operation so as not to adversely affect the identified location; or (2) establish, to the satisfaction of the DCM, on the basis of further archaeological investigation conducted by a qualified marine survey archaeologist or underwater archaeologist using such survey equipment and techniques as deemed necessary by the DCM, either that such operation will not adversely affect the location identified or that the potential cultural resource suggested by the occurrence of the indicators does not exist.
>
> A report of this investigation prepared by the marine survey archaeologist or underwater archaeologist shall be submitted to the DCM and the Manager, BLM OCS Office for their review. Should the DCM determine that the existence of a cultural resource which may be adversely affected by such operation is sufficiently established to warrant protection, the lessee shall take no action that may result in an adverse effect on such cultural resource until the DCM has given directions as to its preservation.
>
> The lessee agrees that if any site, structure, or object of historical or archaeological significance should be discovered during the conduct of any operations on the leased area, he shall report immediately such findings to the DCM and make every reasonable effort to preserve and protect the cultural resource from damage until the DCM has given directions as to its preservation.

Implementation of the Archaeological Stipulation

The 1977 cultural resources baseline study by Coastal Environments Inc. (CEI) established probability zones for the potential occurrence of shipwrecks and prehistoric sites in the northern Gulf of Mexico. The demarcation line between the high probability and low probability zones, as depicted on Visual 1, is primarily derived from the high probability zones identified in the CEI study. Visual 1 reflects a recent change in the position of the line defining the high and low probability zones for archaeological site occurrence in the Mississippi River Delta. This deletion of blocks from the high probability zone is a direct result of the BLM study entitled "Subaqueous Sediment Instabilities in the Offshore Mississippi River Delta" (Coleman, Prior, and Garrison, 1980). The findings presented in this study indicate that most of the blocks in the current Mississippi Delta area are covered by a thick sequence of recent sediments and that faulting, slumping, and mass sediment movement are widespread.

Recent disturbed sediments in the blocks deleted range from at least 30 feet thick up to depths greater than 200 feet thick. These blocks all display some evidence of mass sediment movement in the form of mudflow gullies, mudslides, and mudflow lobes. Due to the thickness of recent sediments within the delta area, further archaeological investigations for prehistoric archaeological sites through current coring techniques are not feasible. Due to the thickness of sediments deposited over the last 100 years (an average of 40 feet) and the mass sediment movement within the delta area, the potential for discovery and preservation of shipwrecks which may occur is also thought to be low. This revised line will be utilized as the primary factor in determining which tracts, if leased, will require site-specific remote sensing surveys as called for in stipulation 1, and in accordance with the MOU between BLM and USGS entitled "Cooperative Procedures Between the U.S. Geological Survey (USGS) and the Bureau of Land Management (BLM) for the Protection of Cultural Resources Related to Marine Oil and Gas Operations" (Appendix C, DEIS for Sales A66/66).

The archaeological lease stipulation, when invoked, requires that a remote sensing survey be conducted for the detection of archaeological resources as per NTL 75-3 (Appendix C, DEIS for Sale 58A) prior to the exploration and development of a lease. This survey, at 150 m line spacing, constitutes only a sampling survey.

BLM has long been aware that archaeologists use intensive search techniques when the survey objective is to actually inventory shipwreck locations for a given area. An even more intensive survey grid is utilized in an intrasite survey to delineate and characterize a suspected wreck site, often followed by actual diving and testing of the site. In contrast, the federal archaeological program on the OCS is built on the legal mandates contained in the National Historic Preservation Act, as amended, E.O. 11593, and the OCS Lands Act, as amended, to protect significant archaeological resources from the adverse effects of federally permitted actions. This protection responsibility on the OCS has been complied with by requiring that the permittee either avoid areas showing evidence of potential archaeological resources or conduct further investigations. In almost all cases, the permittee has chosen avoidance of possible archaeological resources; therefore, little further investigation has been conducted and, consequently, little archaeological data have been gathered as a result of these surveys. The 150 m line spacing for archaeological surveys was chosen as a compromise between closer line spacing, which would provide 100% magnetometer coverage, and what was thought to be economically feasible. It was determined that if all unidentified magnetic anomalies were avoided by the distance to the next survey line (150 m) that it could reasonably be expected that potentially significant archaeological resources are avoided by federally permitted actions. However, separate studies conducted by the state underwater archaeologists for Texas and North Carolina indicate that at 150 m line spacing it is possible to pass by an historically significant shipwreck with no indication whatsoever on the magnetometer record (Clausen and Arnold, 1975; Watts, 1980). Even with closer line spacing and 100% magnetometer survey coverage, there would still remain the question of whether the magnetic signatures alone are sufficient to distinguish a potential shipwreck from areas of modern ferromagnetic debris. Also, assuming that such evidence would continue to be avoided by operators, rather than investigated, no more actual archaeological data would be collected as a result of the surveys at closer line spacing than under the current system.

Although actual evidence of buried prehistoric sites generally cannot be identified by current survey methodology, it appears to be very effective in identifying relict geomorphology which would indicate areas of high probability for the occurrence of prehistoric archaeological sites.

Based on the archaeological demarcation line (Visual 1), BLM intends to recommend to the DCM that remote sensing surveys performed at 150 m line spacing be required on the following tracts should they be leased in the proposed sales:

67: Tracts 4, 5, 17-28, 30-37, 41-49, 52-58, 61-71, 75-84, 86-89, 91-93, 97, 98, 101, 102, and 106-126.
69: Tracts 1-16, 22-25, 27-31, 33-39, 47-55, 59-63, 65-73, 75, 76, 80-83, 86-90, 92, 98, 99, 103-119, 121-125, and 128-131.

In summary, adoption of the archaeological stipulation would minimize the probability that a significant archaeological resource would be adversely affected by the oil and gas exploration and development which would occur as a result of these proposed sales. Due to the sampling nature of the magnetometer survey, pre-19th century shipwrecks may not be as well protected by current marine survey methodology as more recent vessels which contain large amounts of iron.

b. Biological Stipulations

Oil and gas exploration and development activities have the potential for causing severe harm to certain productive and unique biological communities found on hard bottom areas and areas of significant topographical relief. (These communities are discussed in Section III.B.2.) Stipulations have been developed to protect these communities from adverse impacts due to oil and gas activities and will be made a part of any lease resulting from these proposed sales which is on or sufficiently close to an area of biological significance upon which the biota of that area might be adversely affected by oil and gas exploration and development.

These stipulations have been developed during the past six years in consultation and coordination with FWS and USGS. In addition, advice has been received from other agencies, such as EPA and NMFS, as well as from the industry and other interested groups. Finally, in designing these stipulations, extensive use has been made of BLM and industry studies in the area, including those monitoring studies required by lease stipulations; i.e., Bright and Rezak, 1976, 1978a, and 1978b, and Mobil, 1975. Other industry-funded monitoring reports may be examined in the New Orleans OCS Office.

In general, there are four types of biological stipulations applied in the Gulf of Mexico. (It must be recognized, however, that specific tracts may have a stipulation imposed which will vary in some details depending upon the conditions prevailing in that area.)

1. Stipulations in the area of the East and West Flower Garden Banks are the most stringent because of the unique and sensitive nature of these coral reefs. These stipulations:

   a. prohibit any activity, including the placement of pipelines, within the 85 m isobaths of the banks;
   b. require the shunting of all drilling fluids and cuttings to within 10 m of the bottom for activities within 3 nmi of the 85 m isobath; and
   c. require a monitoring program to assess the impacts of the activities on the biota of the banks to be carried out for activities within 1 nmi of the 100 m isobath.

Two tracts, one at each bank, are affected: 67-224 and 67-225.

2. Stipulations for leases on or near certain banks close to the shelf break of the central Gulf which rise within 85 m of the surface water are somewhat less stringent but still serve to protect the biota of the bank. All activities within the 85 m isobath are prohibited. For those banks in water shallower than 85 m, a closing isobath would be selected so that protection of the bank would be maintained; within 1 nmi of the 85 m isobath, ("1 Mile Zone") shunting is required; and between 1 nmi and 3 nmi of the 85 m isobath ("3 Mile Zone") either shunting or monitoring would be required. If monitoring showed that the biota of the bank were being affected by the oil and gas activity, shunting could be imposed. Five banks and twelve tracts are affected: Applebaum Bank (tracts 67-39 and 67-40); Parker Banks (tracts 67-72, 67-73, and 67-74); Diaphus Bank (tract 67-96); Geyer Bank (tracts 67-151, 67-152, 67-153, and 67-154); and Fishnet Bank (tracts 69-78 and 69-79)—the 76 m isobath defines this bank.

3. There are several banks, particularly off the south Texas coast, having less relief and rising from water shallower than those mentioned above which are subjected to a much higher level of natural turbidity and sedimentation upon which the biotic communities are less diverse and productive. These banks will receive protection by a stipulation prohibiting any activity within the boundary of the bank itself, which will usually be the deepest closing isobath of the bank, and by requiring shunting within 1 nmi of the bank, and for production drilling only, requiring shunting within 3 nmi of the bank. Two banks and five tracts are affected: Southern Bank (tracts 67-13, 67-14, 69-18, 69-19, and 69-20)—the 80 m isobath defines this bank; tract 67-13 is also partially in the 3 Mile Zone of Hospital Bank to the north.

4. There are areas in the eastern Gulf having seafloors characterized by sparsely distributed rocky outcrops a few meters in relief. These "live bottom areas" (described in more detail in Section II.B.9. of the FEIS for Sale 65) contain biological assemblages consisting of sessile flora and fauna which tend to attract or accumulate turtles and fish. Such areas are richer and more diverse and productive than the surrounding sea bottom; thus, they are considered worthy of protection from the potential but adverse impacts of oil and gas activities. These areas are not well-known or mapped; therefore, the stipulation applied in areas where live bottoms might occur will require the lessee to provide a bathymetry map of the area in which drilling is desired with an interpretation of any survey data (their own or the government's) for the possible presence of live bottom areas. If the data indicate that live bottoms might exist in the area, the lessee will be required to submit photo or other documentation to substantiate that such areas are not present. If it is determined that drilling may take place in the area despite the presence of live bottoms, the lessee will be required to take measures designed to protect the live bottoms, which may include (but are not limited to) shunting, monitoring, or transporting of all drilling effluents away from the live bottom areas. Because of the paucity of biota at great depths, this stipulation will be applied only to those tracts in 100 m water depth or less. One hundred and seven (107) tracts will be affected by this stipulation:

67-106 through 67-126
67-176 through 67-223
69-121 through 69-125
69-128 through 69-131
69-191 through 69-197
69-200
69-203
69-206
69-207
69-210
69-211
69-214
69-215
69-218
69-219
69-222
69-223
69-226
69-227
69-230
69-231
69-234
69-235
69-238
69-239
69-243
69-247

In order to accomplish the protection described above, the specific stipulations described in (1), (2), and (3) below will be made a part of any lease that might result from this proposal for the tracts indicated. A map is provided for each of the banks affected.

a. Central and Western Gulf of Mexico Banks

(1) Biological Resources Protection for Southern Bank and Hospital Bank. (To be included only in leases resulting for tracts 67-13, 67-14, 69-18, 69-19, and 69-20, Mustang Island Area, East Addition Blocks A-151, A-152, and Mustang Island Area Blocks A-15, A-17, and A-18, respectively.)

(a) Operations within the areas shown as "1 Mile Zone" in Figure I-1 (Southern and Hospital Banks) shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than six meters, from the bottom.

(b) All production and development operations within the areas shown as "3 Mile Zone" in Figure I-1 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than six meters, from the bottom.

(2) *Biological Resources Protection for Applebaum Bank.* (To be included only in leases resulting for tracts 67-39 and 67-40, High Island Area, South Addition Blocks A-579 and A-580.)

Operations within the area shown as "3 Mile Zone" in Figure I-2 shall be restricted as specified in either (a) or (b) below at the option of the lessee.

(a) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(b) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.
The monitoring program shall indicate that the monitoring investigations will be conducted by qualified, independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM on a schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank are being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the DCM shall require shunting as specified in (a) above or other appropriate operational restrictions.

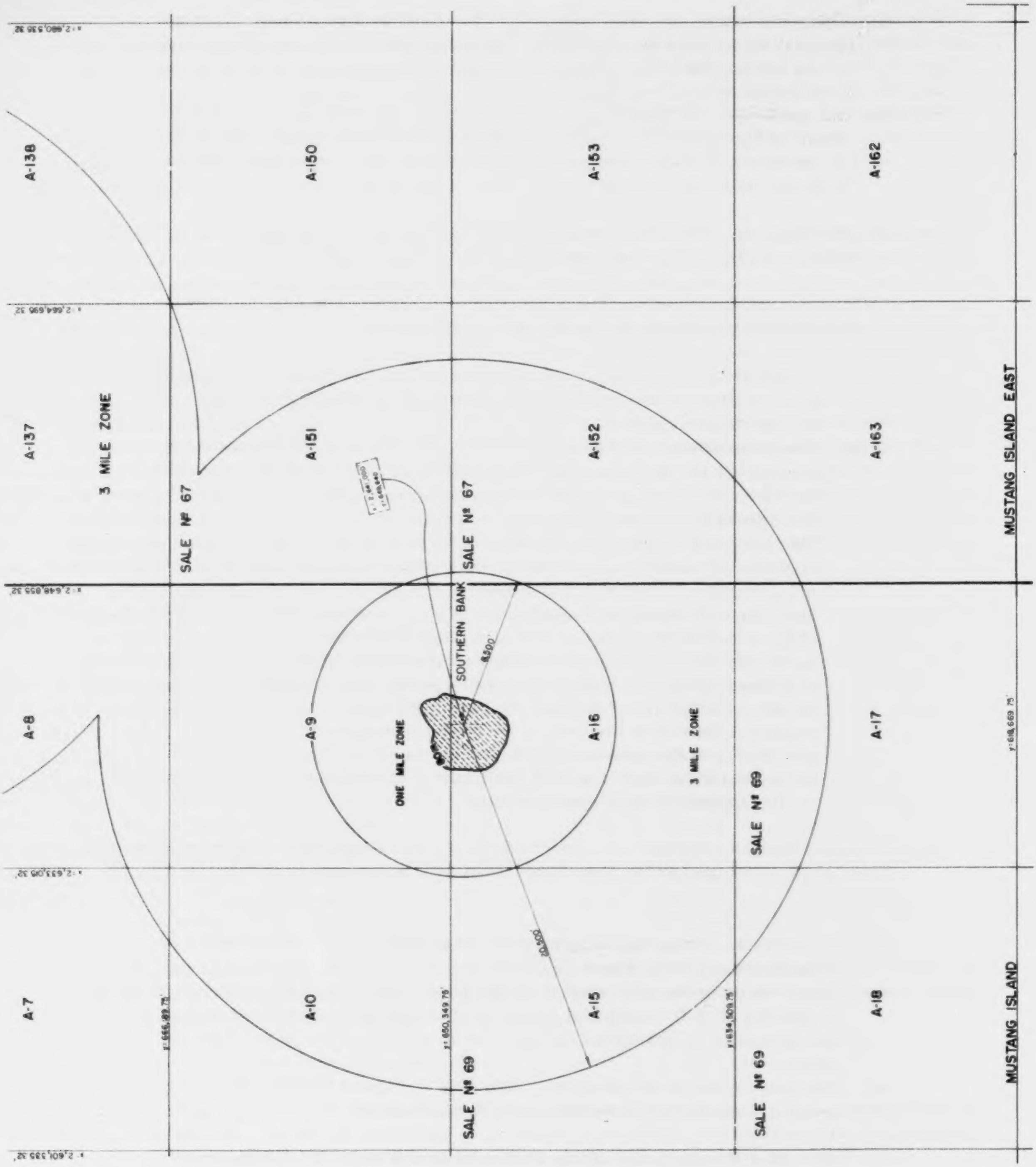
(3) *Biological Resources Protection for Parker Banks.* (To be included only in leases resulting for tracts 67-72, 67-73, and 67-74, South Marsh Island Area, South Addition Blocks 194, 202, and 203.)

(a) No structures, drilling rigs, or pipelines will be allowed within the 85 m isobath of Parker Banks as shown in Figure I-3.

(b) Operations within the area shown as "1 Mile Zone" in Figure I-3 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(c) Operations within the area shown as "3 Mile Zone" in Figure I-3 shall be restricted as specified in either (1) or (2) below at the option of the lessee.

(1) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.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A-150
A-153
A-162
A-137
3 MILE ZONE
SALE Nº 67
A-151
SALE Nº 67
A-152
A-163
MUSTANG ISLAND EAST
A-8
A-9
ONE MILE ZONE
SOUTHERN BANK
8500'
A-16
3 MILE ZONE
SALE Nº 69
A-17
A-7
A-10
20,500'
A-15
A-18
SALE Nº 69
SALE Nº 69
MUSTANG ISLAND

Figure I-1 Southern Bank (Tracts 67-13, 67-14, 69-18, 69-19 and 69-20)

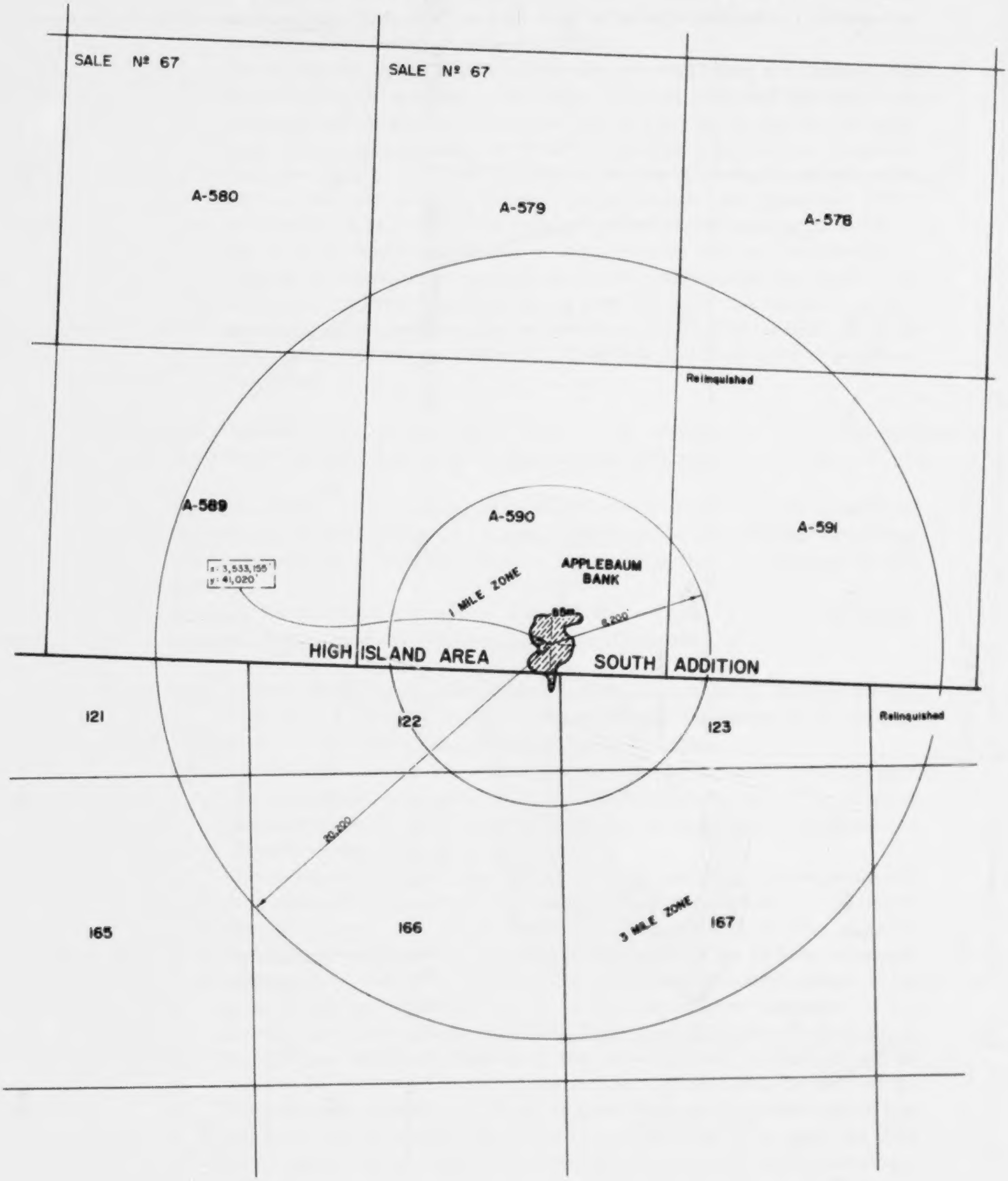

SALE Nº 67
SALE Nº 67
A-580
A-579
A-578
Relinquished
A-589
A-590
A-591
x: 3,533,155'
y: 41,020'
1 MILE ZONE
APPLEBAUM
BANK
85m
6,200'
HIGH ISLAND AREA
SOUTH ADDITION
121
122
123
Relinquished
20,200'
165
166
3 MILE ZONE
167

Figure I-2 Applebaum Bank (Tracts 67-39 and 67-40)

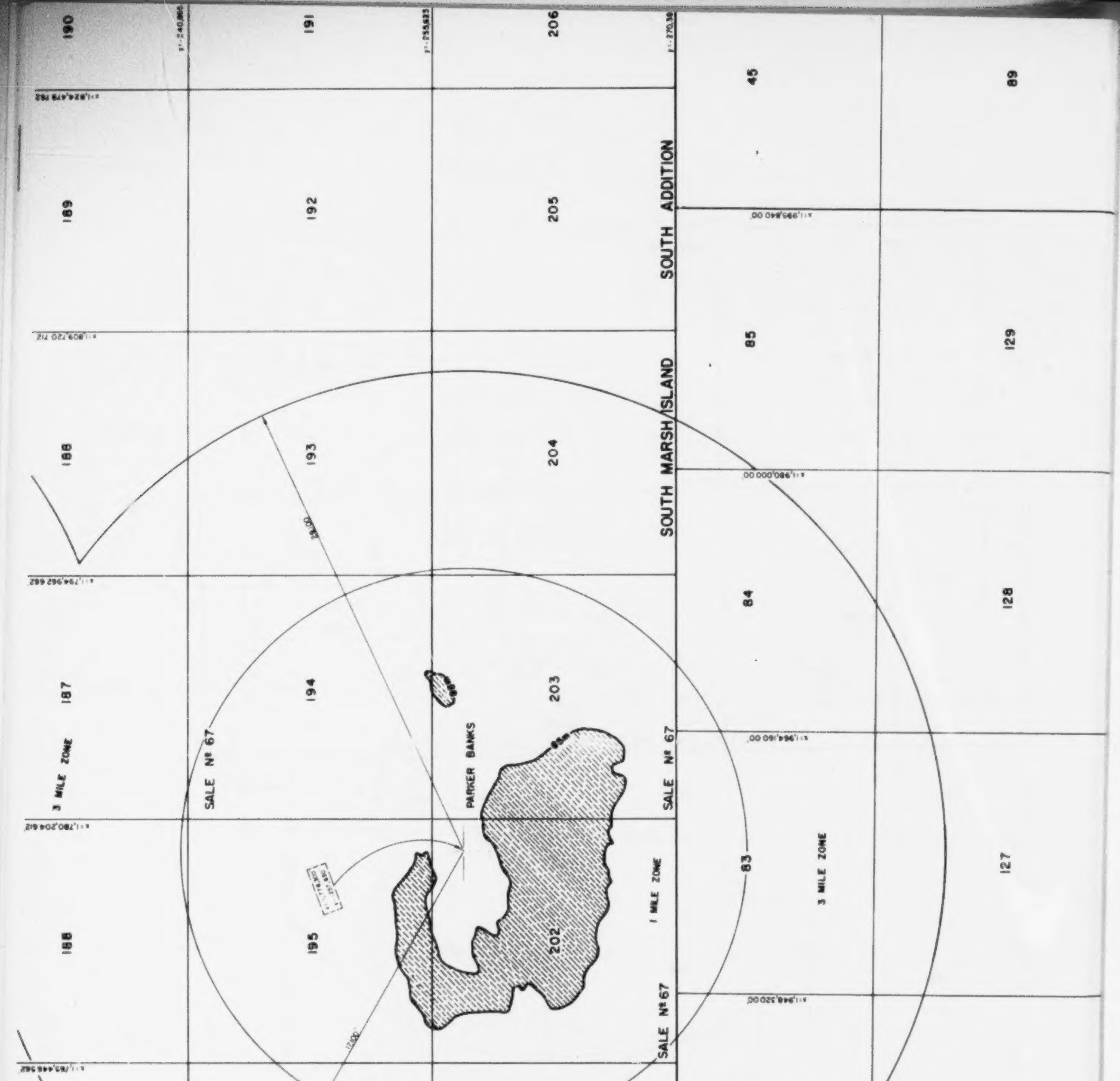

190
191
206
45
89
189
192
205
SOUTH ADDITION
SOUTH MARSH ISLAND
85
129
188
193
204
84
128
187
194
203
3 MILE ZONE
SALE Nº 67
PARKER BANKS
83
127
1 MILE ZONE
188
195
202
189
196
201
82
126
81
125
2300'
1700'
x=1,824,478.162
x=1,809,720.712
x=1,794,962.662
x=1,780,204.612
x=1,765,446.562
x=1,750,688.512
x=1,995,840.00
x=1,980,000.00
x=1,964,160.00
x=1,948,320.00
x=1,932,480.00

Figure I-3 Parker Banks (Tracts 67-72, 67-73 and 67-74)

(2) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified, independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM on a schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank are being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the DCM shall require shunting as specified in (1) above or other appropriate operational restrictions.

(4) *Biological Resources Protection for Diaphus Bank.* (To be included only in the lease resulting for tract 67-96 South Timbalier Area, South Addition Block 314.)

(a) Operations within the area shown as "1 Mile Zone" in Figure I-4 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(b) Operations within the area shown as "3 Mile Zone" in Figure I-4 shall be restricted as specified in either (1) or (2) below at the option of the lessee.

(1) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(2) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified, independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM on a schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank are being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the DCM shall require shunting as specified in (1) above or other appropriate operational restrictions.

(5) *Biological Resources Protection for Geyer Bank.* (To be included only in leases resulting for tracts 67-151, 67-152, 67-153, and 67-154, Garden Banks Area Blocks 105, 106, 149, and 150.)

(a) No structures, drilling rigs, or pipelines will be allowed within the 85 m isobath of Geyer Bank as shown in Figure I-5.

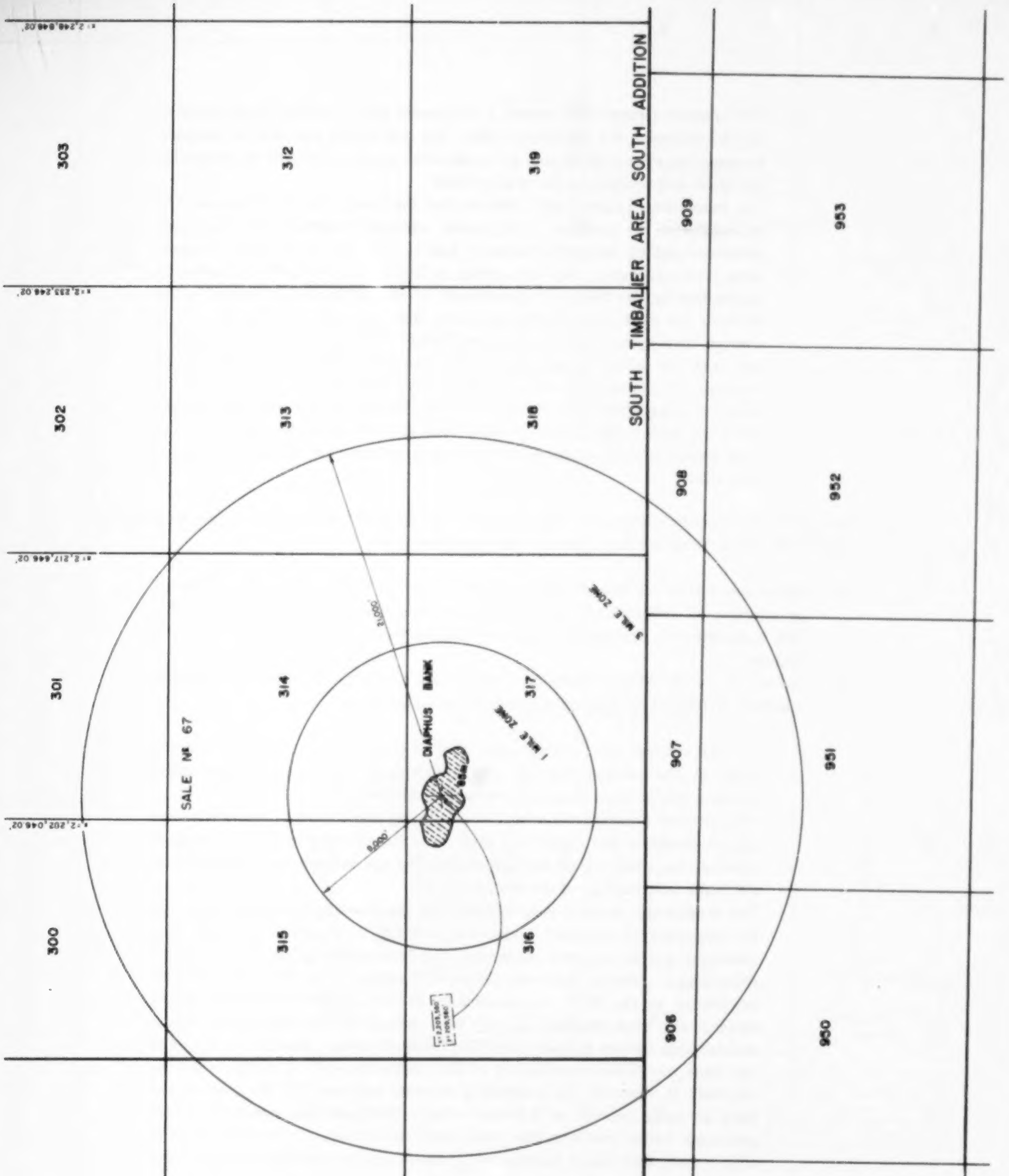

x = 2,248,846.02
x = 2,233,246.02
x = 2,217,646.02
x = 2,202,046.02
303
302
301
300
331
312
313
314
315
332
319
318
317
316
386
SOUTH TIMBALIER AREA SOUTH ADDITION
909
908
907
906
953
952
951
950
SALE No 67
DIAPHUS BANK
95m
1 MILE ZONE
3 MILE ZONE
21,000'
9,000'

Figure I-4 Diaphus Bank (Tract 67-96)

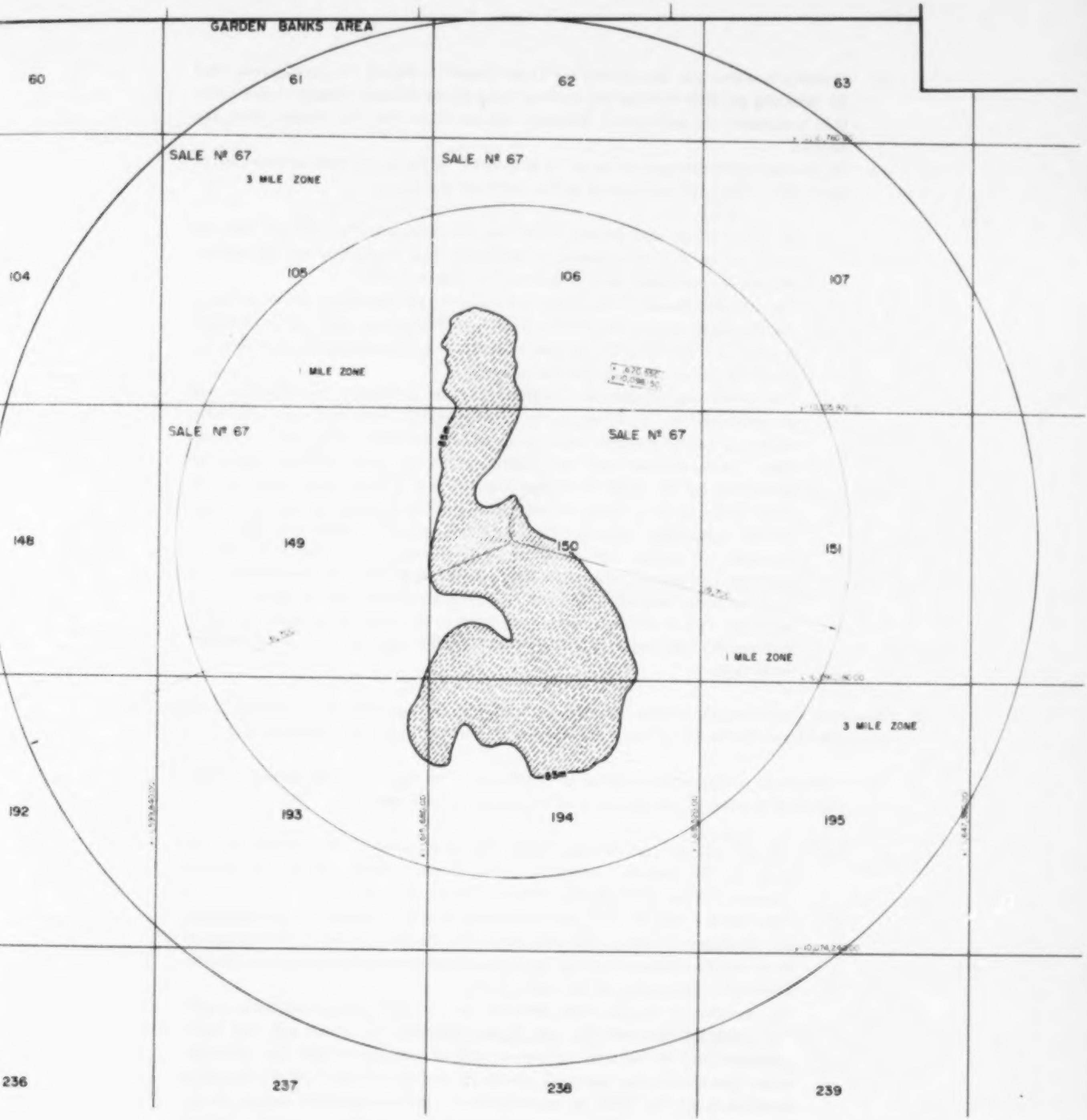

GARDEN BANKS AREA
60
61
62
63
SALE Nº 67
3 MILE ZONE
SALE Nº 67
104
105
106
107
1 MILE ZONE
SALE Nº 67
SALE Nº 67
85m
148
149
150
151
1 MILE ZONE
3 MILE ZONE
85m
192
193
194
195
236
237
238
239

Figure I-5 Geyer Bank (Tracts 67-151, 67-152, 67-153 and 67-154)

(b) Operations within the area shown as "1 Mile Zone" in Figure I-5 shall be restricted by shunting all drill cuttings and drilling fluids to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(c) Operations within the area shown as "3 Mile Zone" in Figure I-5 shall be restricted as specified in either (1) or (2) below at the option of the lessee.

(1) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(2) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified, independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM on a schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings presents no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank are being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of the bank, the DCM shall require shunting as specified in (1) above or other appropriate operational restrictions.

(6) Biological Resources Protection for Fishnet Bank. (To be included only in leases resulting for tracts 69-78 and 69-79, South Marsh Island Area, South Addition Blocks 158 and 159.)

(a) Operations within the area shown as "3 Mile Zone" in Figure I-6 shall be restricted as specified in either (1) or (2) below at the option of the lessee.

(1) All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

(2) The operator (lessee) shall submit a monitoring plan as part of the exploration and development and production plans. The monitoring plan will be designed to assess the effects of oil and gas exploration and development operations on the biotic communities of the nearby banks.

The monitoring program shall indicate that the monitoring investigations will be conducted by qualified, independent scientific personnel and that these personnel and all required equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM on a schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations. If it is decided that surface disposal of drilling fluids or cuttings present no danger to the bank, no further monitoring of that particular well or platform will be required. If, however, the monitoring program indicates that the biota of the bank are being harmed, or if there is a great likelihood that operation of that particular well or platform may cause harm to the biota of tha bank, the DCM shall require shunting as specified in (a) above or other appropriate operational restrictions.

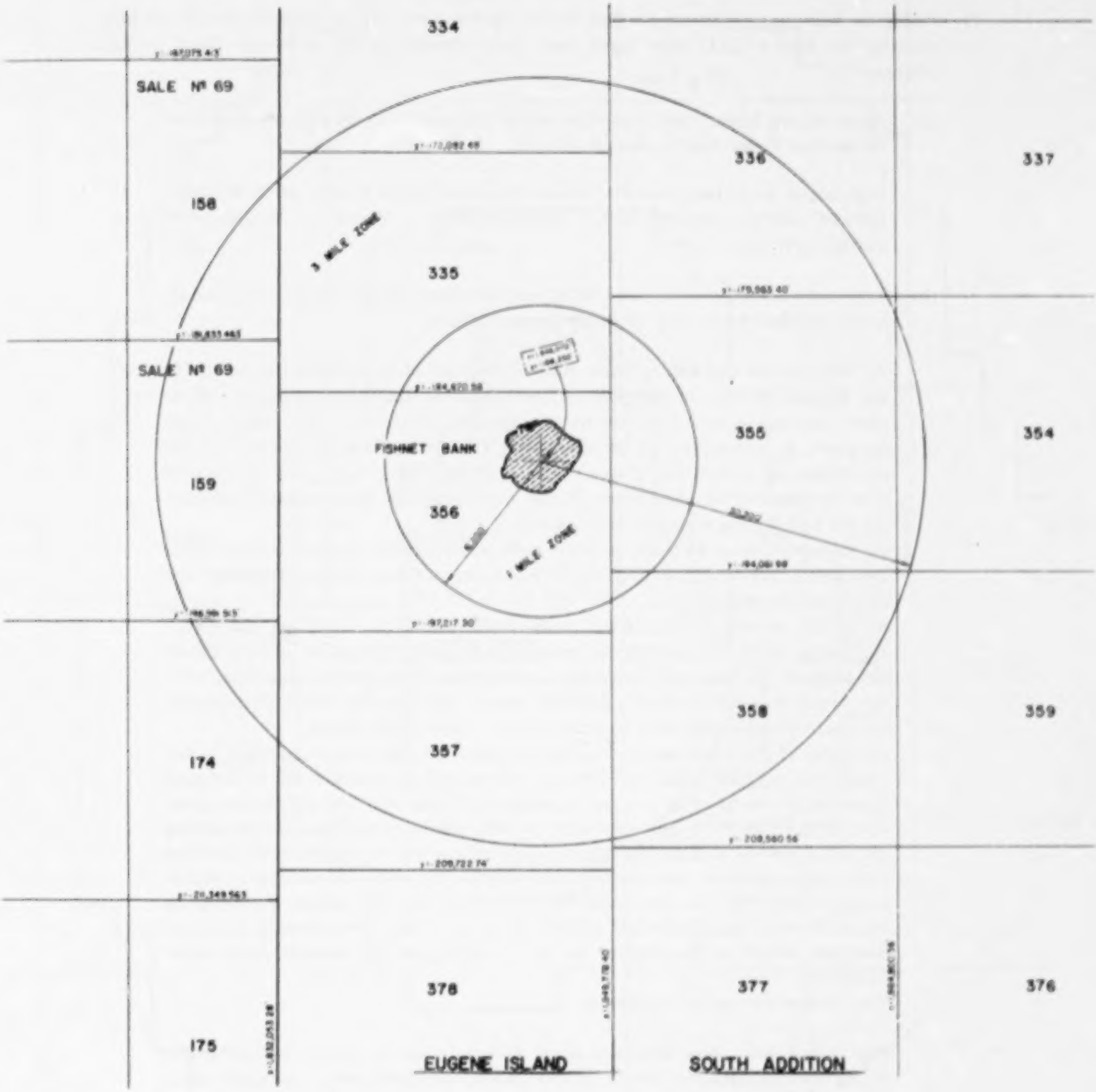

334
SALE Nº 69
336
337
158
3 MILE ZONE
335
y = 179,583.40
SALE Nº 69
FISHNET BANK
355
354
159
356
1 MILE ZONE
y = 197,217.30
358
359
174
357
y = 208,560.56
y = 209,722.74
378
377
376
175
EUGENE ISLAND
SOUTH ADDITION

Figure I-6 Fishnet Bank (Tracts 69-78 and 69-79)

(7) *Biological Resources Protection for East Flower Garden Bank.* (To be included only in the lease resulting for tract 67-224, High Island Area, East Addition, South Extension Block A-374.) (Figure I-7)

(a) No structures, drilling rigs, or pipelines will be allowed within the aliquots established for the East Flower Garden Bank as follows:

High Island Area, East Addition, South Extension, Block A-374: SW¼NW¼NW¼; NW¼SW¼NW¼; S½SW¼NW¼; SW¼NE¼SW¼; W½SW¼; W½SE¼SW¼; SE¼SE¼SW¼.

(b) Exploration, development, and production operations are permitted within the aliquots described below with the following restructions:

All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom; however, if the shunting method is not adequate, as determined by the monitoring program proceedings outlined in this stipulation, to protect the unique character of the subject area, then the material must be transported a minimum of ten miles from any 50 m isobath surrounding live reef-building coral before disposal.

No garbage, untreated sewage, or other solid waste shall be disposed of from vessels (workboats, crew-boats, supply boats, pipelaying vessels) during exploration and development operations.

No drilling permits shall be issued by the DCM until he has found that the lessee's exploration plans and development and production plans filed under 30 CFR 250.34 are adequate to insure that exploration, development and production operations in the leased area will have no significant adverse effect on the biotic communities associated with the high value reef sites on the Flower Garden Banks.

As a part of the exploration plans and development and production plans, a reef monitoring program must be included. The monitoring program will be designed to assess the effects of oil and gas exploration, development, and production operations on the viability of the coral reefs and associated communities. The monitoring plan shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that program personnel and equipment will be available at the time of operations. The monitoring team will submit its findings to the DCM, on a regular schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations.

The affected aliquots are as follows:

High Island Area, East Addition, South Extension, Block A-374: SW¼SW¼NE¼; W½NE¼NW¼; SE¼NE¼NW¼; N½NW¼NW¼; SE¼NW¼NW¼; NE¼SW¼NW¼; SE¼NW¼; N½NE¼SW¼; SE¼NE¼SW¼; NE¼SE¼SW¼; W½NW¼SE¼; SE¼NW¼SE¼; SW¼SE¼; SW¼SE¼SE¼.

(c) Exploration, development, and production operations are permitted within the aliquots described below with the following restrictions:

All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

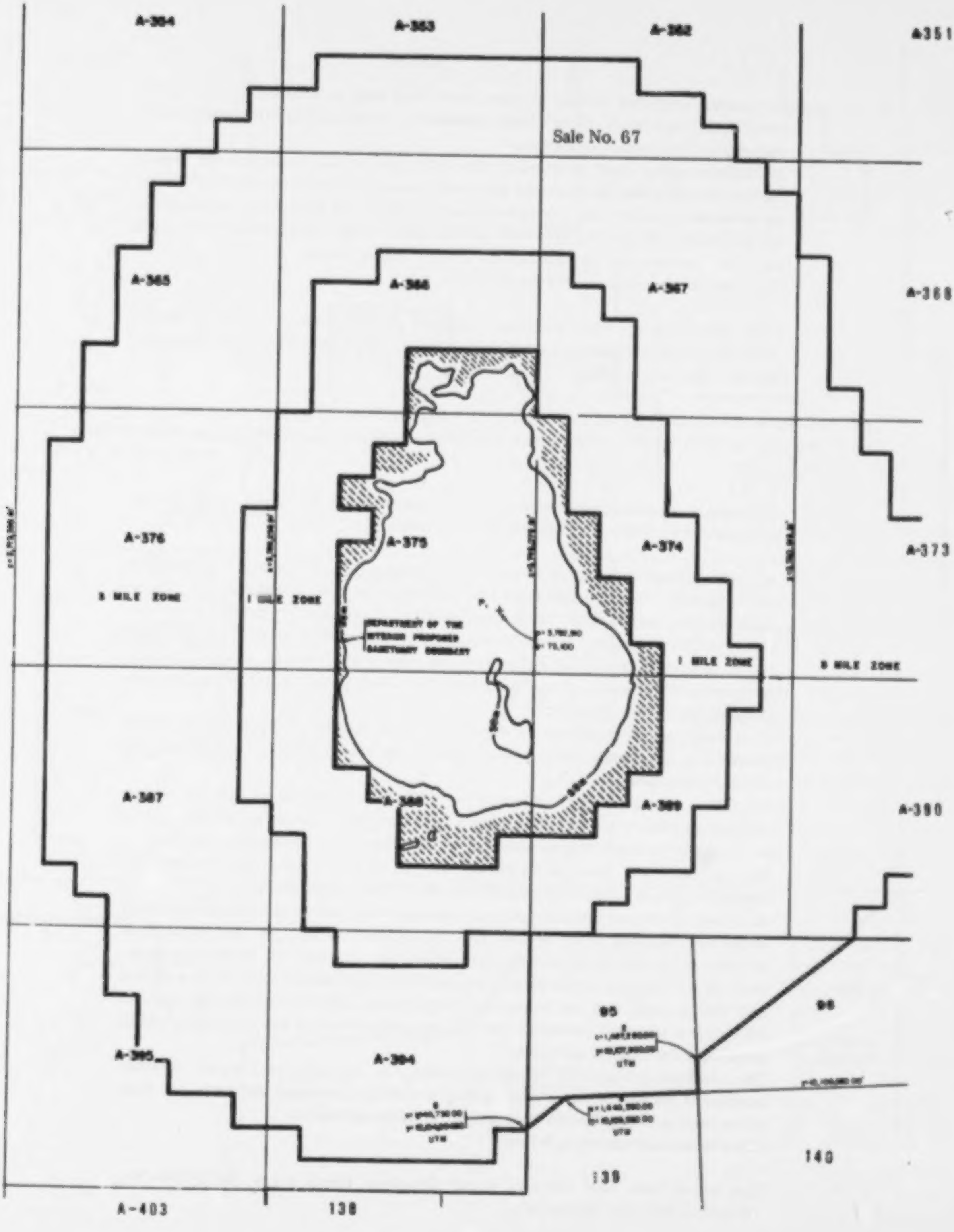

A-384
A-383
A-382
A351
Sale No. 67
A-385
A-386
A-387
A-388
A-376
A-375
A-374
A-373
3 MILE ZONE
1 MILE ZONE
DEPARTMENT OF THE INTERIOR PROPOSED SANCTUARY BOUNDARY
1 MILE ZONE
3 MILE ZONE
A-387
A-388
A-389
A-390
95
96
UTM
A-395
A-394
UTM
UTM
140
139
A-403
138

Figure I-7. East Flower Garden Bank

No garbage, untreated sewage, or other solid waste shall be disposed of from vessels (workboats, crew-boats, supply boats, pipelaying vessels) during exploration, development, and production operations.

No drilling permits shall be issued by the DCM until he has found that the lessee's exploration plans and development and production plans filed under 30 CFR 250.34 are adequate to insure that exploration, development, and production operations in the leased area will have no significant adverse effect on the biotic communities associated with the high value reef sites on the Flower Garden Banks.

The affected aliquots are as follows:

High Island Area, East Addition, South Extension, Block A-374 N½NE¼; N½S½NE¼; SE¼SW¼NE¼; S½SE¼NE¼; NE¼NE¼NW¼; NE¼SE¼; NE¼NW¼SE¼; N½SE¼SE¼; SE¼SE¼SE¼.

(8) *Biological Resources Protection for West Flower Garden Bank.* (To be included only in the lease resulting for tract 67-225, High Island Area, East Addition, South Extension Block A-385.) (Figure I-8)

(a) Exploration, development, and production operations are permitted within the aliquots described below with the following restrictions:

All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom; however, if the shunting method is not adequate, as determined by the monitoring program proceedings outlined in this stipulation, to protect the unique character of the subject area, then the material must be transported a minimum of ten miles from any 50 m isobath surrounding live reef-building coral before disposal.

No garbage, untreated sewage, or other solid waste shall be disposed of from vessels (workboats, crew-boats, supply boats, pipelaying vessels) during exploration and development operations.

No drilling permits shall be issued by the DCM until he has found that the lessee's exploration plans and development and production plans filed under 30 CFR 250.34 are adequate to insure that exploration, development, and production operations in the lease area will have no significant adverse effect on the biotic communities associated with the high value reef sites on the Flower Garden Banks.

As a part of the exploration plans and development and production plans, a reef monitoring program must be included. The monitoring program will be designed to assess the effects of oil and gas exploration, development, and production operations on the viability of the coral reefs and associated communities. The monitoring plan shall indicate that the monitoring investigations will be conducted by qualified independent scientific personnel and that program personnel and equipment will be available at the time of operations.

The monitoring team will submit its findings to the DCM on a regular schedule established by the DCM, or immediately in case of imminent danger to the biota of the bank resulting directly from drilling or other operations.

The affected aliquots are as follows:

High Island Area, East Addition, South Extension, Block A-385: SW¼NW¼NW¼; SW¼NW¼; W½SW¼; W½E½SW¼.

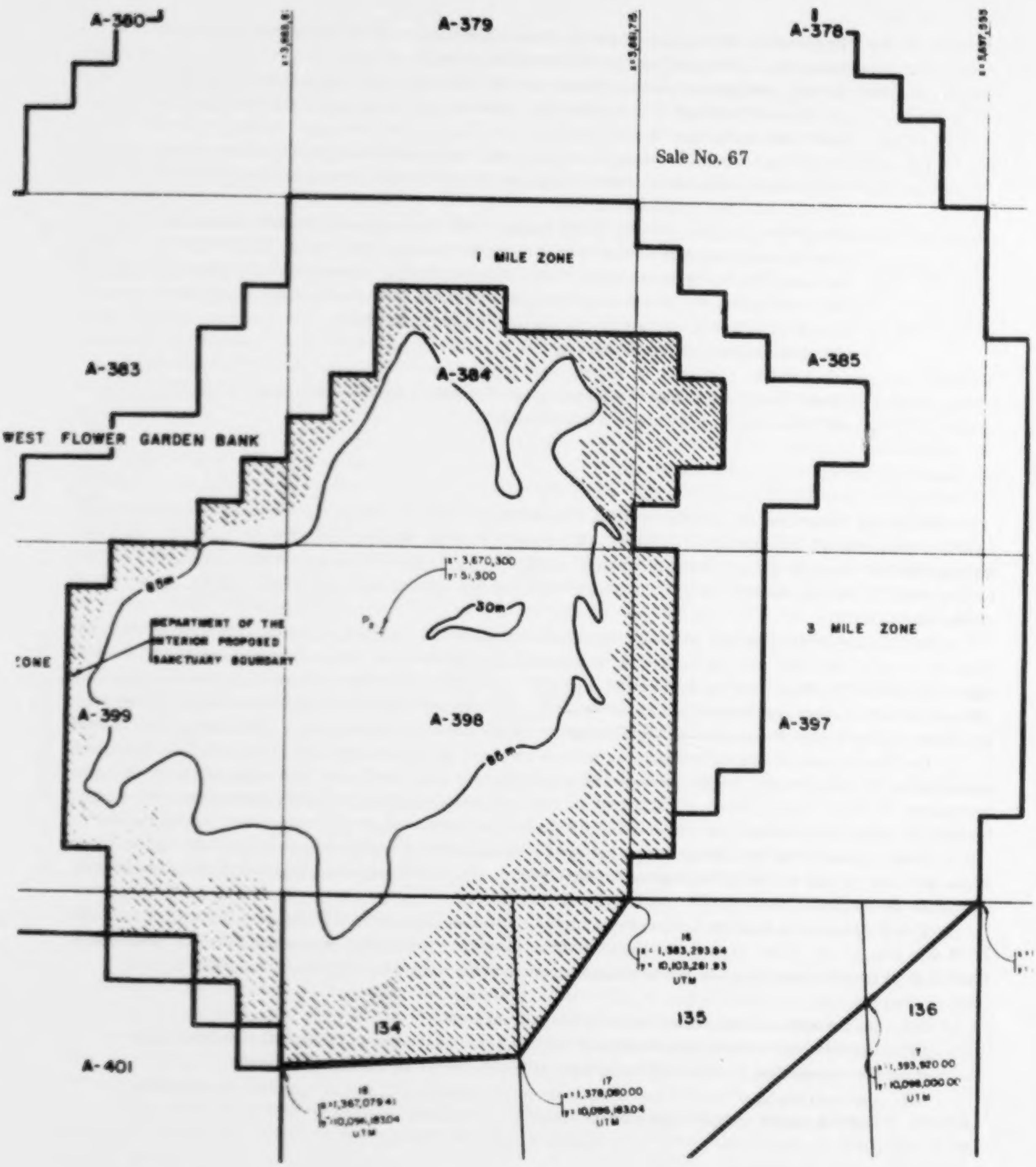

A-380
A-379
A-378
Sale No. 67
1 MILE ZONE
A-383
A-384
A-385
WEST FLOWER GARDEN BANK
x= 3,670,300
y= 51,300
P_2
30m
85m
DEPARTMENT OF THE
INTERIOR PROPOSED
SANCTUARY BOUNDARY
ZONE
3 MILE ZONE
A-399
A-398
A-397
85m
16
x= 1,383,293.94
y= 10,103,281.93
UTM
134
135
136
A-401
18
x=1,367,079.41
y=10,096,183.04
UTM
17
x=1,378,080.00
y=10,096,183.04
UTM
7
x=1,393,920.00
y=10,098,000.00
UTM

Figure I-8. West Flower Garden Bank

(b) Exploration, development, and production operations are permitted within the aliquots described below with the following restrictions:

All drill cuttings and drilling fluids must be disposed of by shunting the material to the bottom through a downpipe that terminates an appropriate distance, but no more than ten meters, from the bottom.

No garbage, untreated sewage, or other solid waste shall be disposed of from vessels (workboats, crew-boats, supply boats, pipelaying vessels) during exploration, development, and production operations.

No drilling permits shall be issued by the DCM until he has found that the lessee's exploration plans and development and production plans filed under 30 CFR 250.34 are adequate to insure that exploration, development, and production operations in the leased area will have no significant adverse effect on the biotic communities associated with the high value reef sites on the Flower Garden Banks.

The affected aliquots are as follows:

High Island Area, East Addition, South Extension, Block A-385: E½; E½E½W½; W½E½NW¼; E½NW¼NW¼; NW¼NW¼NW¼.

b. Eastern Gulf of Mexico Live Bottom Areas

Biological Protection of 107 Tracts With Potential Live Bottom Areas. (To be included only in leases resulting for tracts 67-106 through 67-126, 67-176 through 67-223, 69-121 through 69-125, 69-128 through 69-131, 69-191 through 69-197, 69-200, 69-203, 69-206, 69-207, 69-210, 69-211, 69-214, 69-215, 69-218, 69-219, 69-222, 69-223, 69-226, 69-227, 69-230, 69-231, 69-234, 69-235, 69-238, 69-239, 69-243, and 69-247 on the Florida Shelf.)

Prior to any drilling activity or the construction or placement of any structure for exploration or development on a lease, including but not limited to well drilling and pipeline and platform placement, the lessee will submit to the DCM as part of his exploration and/or development plan a bathymetry map that was prepared utilizing remote sensing and/or other survey techniques. This map will include interpretations for the presence of live bottom areas within a minimum of 1,820 m radius of the proposed exploration or production activity site.

For the purpose of this stipulation, live bottom areas are defined as those areas which contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans, or corals living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography; or whose lithotope favors the accumulation of turtles, fishes, and other fauna.

If it is determined that the remote sensing data indicate the presence of hard or live bottom areas, the lessee will also submit to the DCM photo-documentation of the sea bottom near proposed exploratory drilling sites or proposed platform locations.

If it is determined that live bottom areas might be adversely impacted by the proposed activities, then the DCM will require the lessee to undertake any measure deemed economically, environmentally, and technically feasible to protect live bottom areas. These measures may include, but are not limited to, the following:

(a) the relocation of operations to avoid live bottom areas;
(b) the shunting of all drilling fluids and cuttings in such a manner as to avoid live bottom areas;
(c) the transportation of drilling fluids and cuttings to approved disposal sites; and
(d) the monitoring of live bottom areas to assess the adequacy of any mitigation measures taken and the impact of lessee initiated activities.

c. Geologic Hazards Stipulation

USGS presently acquires and evaluates geologic hazards information on the OCS through a three phase program. The initial phase, carried out by the Geologic Division with some BLM funding, has two objectives: (1) broad scale reconnaissance surveys with high-resolution geophysical systems to map geological hazards such as submarine landslides and seafloor faults, and (2) research on geologic processes such as gas-charged sediments and seafloor sediment transport to evaluate the degree of hazard which these features or processes represent.

The second phase of the geologic hazards program, conducted by the Conservation Division, is to specifically identify, evaluate, and report on all tracts proposed for leasing that contain geologic hazard areas which could preclude oil and gas exploration and development activities and to recommend tract withdrawals or lease stipulations, as appropriate, to provide assurance to the Secretary, affected states, and the public that any resource discovered can be exploited with acceptable risk. In implementing this phase, USGS acquires high-resolution geophysical data by exclusive contract on a systematic grid over tracts tentatively announced for the proposed sales. The results of these prelease geohazard evaluations are incorporated into the FEIS and SID for each proposed lease sale.

There is, unfortunately, a limit to the information that can be obtained utilizing high-resolution geophysical data. Potentially hazardous features can be identified, located, and, based on past experience, to some degree assessed to severity. But to determine if oil and gas operations can actually take place in such areas, soils engineering information must be obtained in order to ground-truth the geophysical data. Thus, there is a third phase to the geologic hazards program, and since this third phase is extremely site specific and costly, this work is normally done by industry during platform or pipeline location studies prior to the permitting phase.

The third phase, implemented under the post-lease regulatory authority of the Conservation Division, consists of requiring lessees to submit a Shallow Drilling Hazards Report and other site-specific geologic information as required in the Gulf of Mexico Notice to Lessees and Operators No. 78-5, Gulf of Mexico OCS Region Order No. 2, and CFR Part 250.34. This mandatory requirement is imposed on all lessees to assure safety of operations prior to approval of exploration plans. The extent and degree of geologic hazards investigation required of the lessee is at the discretion of the appropriate DCM, who is charged with approval of the safety of OCS operations. The general procedures to be followed by the lessee in conducting site-specific geologic hazards survey are set forth in various Notices to Lessees and Operators (NTL) issued by the regional offices of the Conservation Division, USGS. The NTL and applicable lease stipulations serve as guidance for minimum requirements and in no way restrict the authority of the DCM to impose additional requirements on the lessee when necessary. Under new regulations, 30 CFR Part 250, effective December 13, 1979, all geophysical data and information concerning protection of environmental aspects of the lease may be made available to the public 60 days after submittal to USGS.

For proposed Sales 67 and 69, a contract was awarded by USGS in August 1980 to acquire exclusive high-resolution geophysical data on a 0.8 kilometer by 2.4 kilometer grid over 360 tracts tentatively announced for these proposed sales. Tract-specific geophysical data have previously been acquired over the 112 remaining tracts of the 472 tracts proposed for sale.

Field operations using two vessels were completed in 1980. Instrumentation employed includes a fathometer, subbottom profiler, sparker, and sidescan sonar.

The fathometer provides continuous water depth measurements. The subbottom profiler provides shallow structural information to penetration depths of up to 100 m, while the sparker obtains detailed geophysical information to depths of 300 m below the seafloor. The sidescan sonar uses a high frequency energy source which does not penetrate the sea bottom but provides an acoustic image of the seafloor topography showing natural and man-made irregularities. The configuration of instrumentation used varies in different areas depending on water depth, local geology, and the nature of geologic hazards under investigation.

After data acquisition and processing are completed by the contractor, the final products will be delivered to the Gulf of Mexico OCS Office in Metairie, Louisiana, where analysis and evaluation of geologic hazards will take place by professional geophysicists. This will include identification and mapping of geologic hazards on a tract-by-tract basis. After coordination with Geologic Division scientists from the Office of Marine Geology and after considering all available data, USGS recommendations on tract withdrawals or application of lease stipulations are forwarded to BLM.

Stipulations as a result of geologic conditions which may be hazardous to petroleum exploration, development, and transportation will be applied on a tract-by tract basis after USGS has completed evaluation of the geologic hazards.

As further mitigation of potential geologic hazards, BLM is currently involved in a cooperative studies program with the Office of Marine Geology and Conservation Division, both of USGS, and Louisiana State University. The pilot portion of this large project was to map the sediment instabilities of the submarine Mississippi River Delta, one of the most hazardous areas in the Gulf of Mexico. The oil and gas industry also contributed a great deal of proprietary geophysical and soil boring data to the study. The results have been the accurate mapping of mud flow gullies, mud flow lobes, faults, and other features of instability which could be hazardous to offshore operations. BLM has published the results as Open File Report 80-01. This document has also been invaluable to industry for the planning of offshore platform and pipeline locations. More information on deepwater technology, hurricanes, and the history of oil and gas development has been added to the information of the instability study and was released as Open File Report 80-02. This report provides a more complete description of problems encountered in a potentially hazardous area. Open File Report 80-02 shows how the environmental constraints dictated the operations in the area and spurred a number of new engineering developments, operational practices, and new technology that has been important to safer offshore operations in general.

One of the early cooperative agreements between BLM and USGS commenced in 1974 with Henry Berryhill as Chief Scientist. This work has now produced a newly printed map series presently available at a scale of 1:250,000 for the Port Isabel, Corpus Christi, and Beeville maps. These maps depict the following:

Map I 1254 A	Water Circulation and Rates of Sedimentation
Map I 1254 B	Trace Metal Content and Texture of Sediments
Map I 1254 C	Shallow Subsurface Sediments and Biogeology
Map I 1254 D	Post-Wisconsin Sedimentation and Faulting
Map I 1254 E	Paleogeography of the Shelf - Wisconsin Low Sealevel Stand
Map I 1254 F	Structure of the Continental Terrace

This BLM-USGS geologic mapping project has continued collecting data aimed mainly at the geohazard analysis and sediment features in the Garden Banks, Bouma Bank, and Port Arthur 1:250,000 scale map areas; preliminary data will soon be available. Field work is also underway in the Mobile, Viosca Knoll, and Mississippi Canyon Areas.

The oil and gas industry has viable research ongoing in the Gulf of Mexico over and above what BLM and USGS require or suggest in regulations. Industry is leading in a number of new platform and pipeline design projects with studies to fit new engineering techniques of the geologic hazards problems present in the Gulf of Mexico. The valuable combination of industry and government research probably best explains why leasing and development can continue in deeper water each year without a noticeable increase of accidents and equipment failures in the Gulf of Mexico.

If evaluations indicate hazards in any tract, a stipulation will be applied to insure a warning about the area to require further investigation by industry. The following is an example of a typical geohazards stipulation:

> If the Deputy Conservation Manager (DCM), having reason to believe that portions of this lease area may be subject to mass movements of sediments, unstable slopes, shallow faulting, gaseous sediments, or other potentially hazardous geologic conditions, hereinafter referred to as "geohazards," gives the lessee written notice that the lessor is invoking the provisions of this stipulation, the lessee shall upon receipt of such notice comply with the following requirements:
>
> Prior to any drilling activity or the construction or placement of any structure for exploration or development on the lease, including but not limited to, well drilling and pipeline and platform placement, hereinafter referred to as "operation," the lessee shall demonstrate to the satisfaction of the DCM either that the suspected geohazards are not sufficient to warrant special design considerations or that operations can be designed to protect human life and the environment despite the identified geohazards.
>
> If the DCM determines that significant geohazards do exist within the lease area, and that no design considerations are sufficient to ensure that operations can be safely conducted within the area of identified geohazards, the DCM may, at his discretion, require that all exploration for, and development of, oil or gas be performed from locations outside the area of geohazards.

d. Military Area Stipulation

The following descriptions relate to the stipulations required of the lessee for operations within each warning area (Figure I-9). The stipulations required within the warning areas are given in Table I-1.

Whether compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the outer continental shelf, to any persons or to any property of any person or persons who are agents, employees, or invitees of the lessee, its agents, independent contractors, or subcontractors doing business with the lessee in connection with any activities being performed by the lessee in, on, or above the outer continental shelf, if such injury or damage to such person or property occurs by reason of the activities of any agency of the United States government, its contractors or subcontractors, or any of their officers, agents or employees, being conducted as a part of, or in connection with the programs and activities of the command headquarters listed in Table I-1.

Notwithstanding any limitation of the lessee's liability in Section 14 of the lease, the lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of its officers, agents, or employees The lessee further agrees to indemnify and save harmless the United States against all claims for loss, damage, or injury sustained by the lessee, and to indemnify and save harmless the United States against all claims for loss, damage, or injury sustained by the agents, employees, or invitees of the lessee, its agents, or any independent contractors or subcontractors doing business with the lessee in connection with the programs and activities of the aforementioned military installation, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, or subcontractors, or any of its officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.

Electromagnetic Emissions

The lessee agrees to control his own electromagnetic emissions and those of his agents, employees, invitees, independent contractors, or subcontractors emanating from individual designated defense warning areas in accordance with requirements specified by the commander of the command headquarters listed in Table I-1 to the degree necessary to prevent damage to, or unacceptable interference with, Department of Defense flight, testing, or operational activities conducted within individual designated warning areas. Necessary monitoring control and coordination with the lessee, his agents, employees, invitees, independent contractors, or subcontractors will be effected by the commander of the appropriate onshore military installation conducting operations in the particular warning area; provided, however, that control of such electromagnetic emissions shall in no instance prohibit all manner of electromagnetic communication during any period of time between a lessee, its agents, employees, invitees, independent contractors, or subcontractors and onshore facilities.

Operational

The lessee, when operating or causing to be operated on its behalf, boat or aircraft traffic into the individual designated warning areas shall enter into an agreement with the commander of the individual command headquarters listed in Table I-1 utilizing an individual designated warning area prior to commencing such traffic. Such an agreement will provide for positive control of boats and aircraft operating into the warning areas at all times.

e. Pipeline Transportation Stipulation

In order to minimize the potential danger of spills due to tankering and barging of oil from wells off the Florida Gulf coast and subsequent possible pollution of beaches and harbor, the office of Florida's OCS representative requested a pipeline transportation stipulation applicable to tracts on the continental shelf and slope adjacent to the west coast of Florida for these proposed sales. This request was made in a letter dated July 14, 1980, and was discussed during a DM 655 (S.O. 2974) meeting held at BLM's New Orleans OCS Office on August 26, 1980.

FIGURE I-9

MILITARY WARNING AREAS

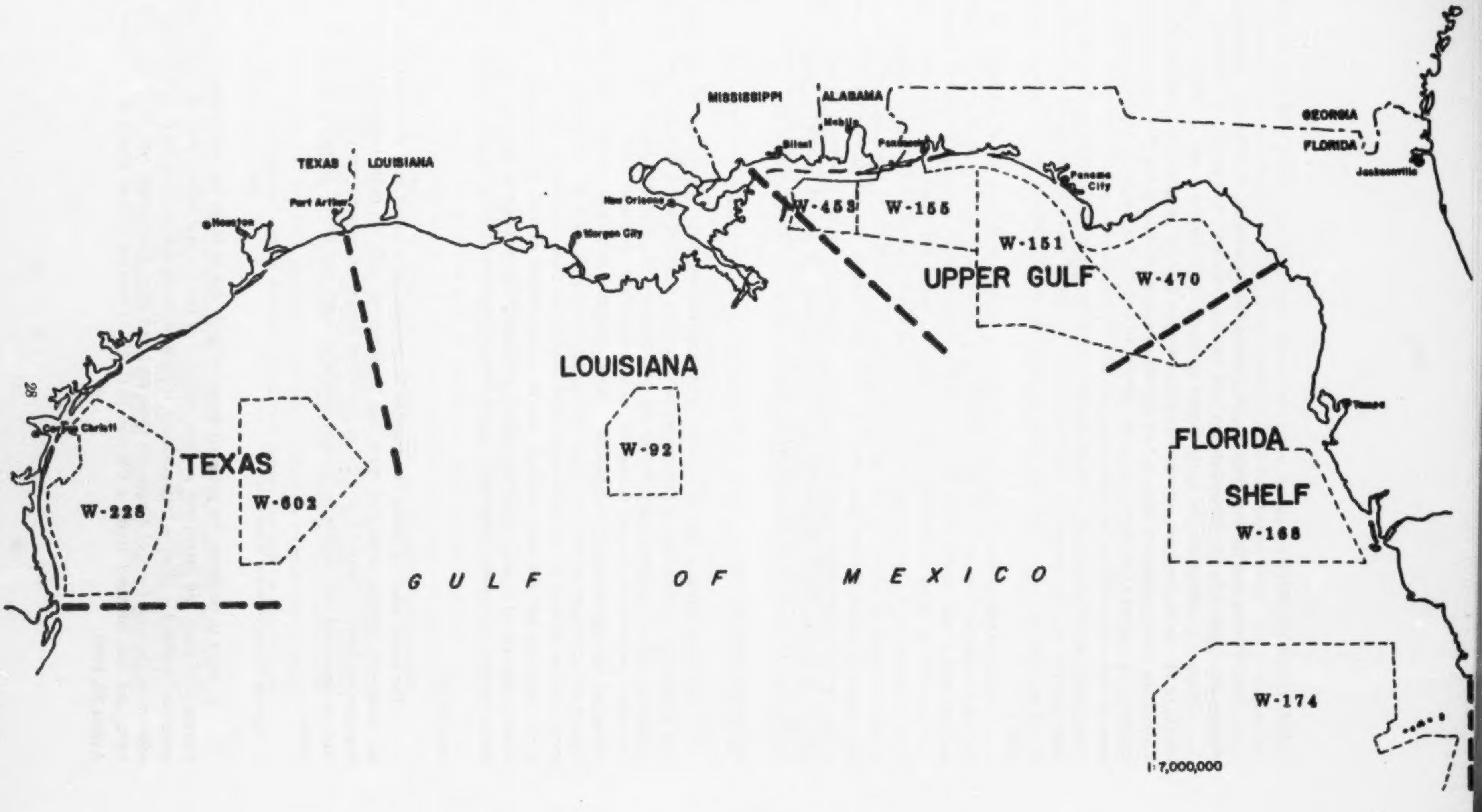

MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
Jacksonville
TEXAS
LOUISIANA
Port Arthur
Houston
New Orleans
Morgan City
Biloxi
Mobile
Pensacola
Panama City
Tampa
Corpus Christi
W-453
W-155
W-151
UPPER GULF
W-470
LOUISIANA
W-92
TEXAS
W-228
W-602
FLORIDA
SHELF
W-168
W-174
G U L F O F M E X I C O
1:7,000,000

Table I-1

Military Area Stipulations

Warning Areas (Figure I-9)	Tract Numbers	No. of Tracts	Stipulations Required	Warning Area Command Headquarters
W168	67-176 through 67-188, 69-159 through 69-177, 69-191 through 69-227	69	Hold Harmless Electromagnetic Emissions Operational	Commander Armament Division Eglin Air Force Base, FL
W602	67-38 through 67-40, 67-143 through 67-150, 69-40 through 69-42	14	Hold Harmless Electromagnetic Emissions Operational	Commander Armament Division Barksdale Air Force Base Shreveport, LA
W92	67-96, 67-165 through 67-175, 69-150 through 69-153	16	Hold Harmless Operational	Naval Air Training Command Naval Air Station Corpus Christi, TX
W228	67-1 through 67-16, 67-25, 67-138 through 67-142, 69-1 through 69-21, 69-23 through 60-26, 69-154 through 69-158	52	Hold Harmless Electromagnetic Emissions Operational	Naval Air Training Command Naval Air Station Corpus Christi, TX
W453	67-106 through 67-110, 67-114 through 67-121, 67-123 through 67-126, 69-103 through 69-107, 69-115 through 69-117	25	Hold Harmless Operational	Commander Armament Division Eglin Air Force Base, FL
W155	67-111 through 67-113, 67-122, 69-121, 69-124, 69-128 through 69-131	13	Hold Harmless Electromagnetic Emissions Operational	Naval Air Training Command Naval Air Station Pensacola, FL
	TOTAL	189		

Pipeline Transportation Stipulation

(To apply to all leases resulting from this lease sale.)

(1) Pipelines will be required: (a) if pipeline rights-of-way can be determined and obtained; (b) if laying of such pipelines is technologically feasible and environmentally preferable; and (c) if, in the opinion of the lessor, pipelines can be laid without net social loss, taking into account any incremental costs of pipelines over alternative methods of transportation and any incremental benefits in the form of increased environmental protection or reduced multiple use conflicts. The lessor specifically reserves the right to require that any pipeline used for transportating production to shore be placed in certain designated management areas. In selecting the means of transportation, consideration will be given to any recommendation of the intergovernmental planning program for assessment and management of transportation of OCS oil and gas with the participation of federal, state, and local government and the industry. All pipelines, including both flow lines and gathering lines for oil and gas, shall be designed and constructed to provide for adequate protection from water currents, storm scouring, and other hazards as determined on a case-by-case basis.

(2) Following the development of sufficient pipeline capacity, no crude oil will be transported by surface vessel from offshore production sites except in the case of emergency. Determination as to emergency conditions and appropriate responses to these conditions will be made by the DCM.

(3) Where the three criteria set forth in the first sentence of this stipulation are not met and surface transportation must be employed, all vessels used for carrying hydrocarbons to shore from the leased area will conform with all standards established for such vessels, pursuant to the Ports and Waterways Safety Act of 1972 (46 U.S.C. 391a), as amended.

3. Other Mitigating Actions

The lease stipulations discussed in the preceding section, in conjunction with OCS Operating Orders and Notices to Lessees, contribute to a minimization of adverse offshore impacts due to oil and gas operations. In addition to the lease stipulations, other means of mitigating actual or potential adverse environmental and socioeconomic impacts are employed. These include programs to regulate discharges of certain effluents or materials, to provide for timely and adequate response to spills, to provide for socioeconomic planning in affected areas, and to reimburse fishermen for lost or damaged gear caused by OCS oil and gas activities or facilities.

a. Regulation of Discharges, Effluents, and Emissions

(1) The Clean Water Act

The Environmental Protection Agency (EPA) regulates effluent discharges, such as drilling fluids, drill cuttings, and produced waters, associated with offshore oil and gas exploration and production pursuant to the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permit program. The goals of this system are to determine and minimize: (a) the effect of disposal of pollutants on human health or welfare; (b) the effect of disposal of pollutants on marine life; (c) the effect of disposal of pollutants on aesthetic, recreation, and economic values; (d) the persistence and permanence of the effects of disposal of pollutants; (e) the effect of the disposal, at varying rates, of particular volumes and concentrations of pollutants; (f) to consider other possible locations and methods of disposal or recycling of pollutants, including land-based alternatives;

and (g) to determine the effect of disposal on alternate uses of the oceans, such as mineral exploitation and scientific study. Section 301 of the Clean Water Act prohibits the discharge of any pollutant without a NPDES permit or in violation of the terms and conditions of a NPDES permit. Section 301 also requires dischargers to meet certain technology-based effluent requirements. For the offshore operations these effluents limits are contained in 40 CFR 435, Subpart A, Oil and Gas Extraction Point Source Category.

Section 403 of the Clean Water Act further requires that an NPDES permit for discharges into marine waters be issued in compliance with EPA's guidelines for determining the potential degradation of marine waters. The final 403(c) Ocean Discharge Criteria guidelines (45 FR 65952) set forth specific criteria for determinations of unreasonable degradation and irreparable harm which must be made prior to the issuance of any NPDES permit for discharges into marine waters.

NPDES permits for offshore oil and gas operations in the federal waters of the Gulf of Mexico are issued by EPA. Individual NPDES permits may be issued to point sources, or permits may be issued to categories of point sources discharging similar types of wastes under EPA's general permit program. Three general NPDES permits for facilities operating in the Gulf of Mexico were issued by EPA on April 3, 1981 (46 FR 20284). Certain lease blocks or lease areas containing potentially productive or unique biological communities are specifically excluded from coverage by the general permits. They may be covered by subsequent general or individual permits.

(2) The Clean Air Act

The Clean Air Act, as amended in 1974 (42 U.S.C. 1851, et seq.), is intended to protect and enhance the quality of the nation's air resources, to initiate and accelerate a national research and development program to achieve prevention and control of air pollution, to provide assistance to state and local governments for air pollution prevention and control programs, to encourage and assist the development and operation of regional air pollution control programs, and to encourage and assist the development and operation of Air Quality Control Regions (AQCR's), eight of which include coastal areas of the Gulf of Mexico OCS area. The EPA has promulgated national primary and secondary air quality standards for certain pollutants. All onshore operations and facilities will be required to comply with federal, state, and local regulations concerning air pollution control and prevention.

(3) Regulation of OCS Oil and Gas Related Air Emissions

The OCS Lands Act Amendments of 1978 (P.L. 95-372) authorizes the Secretary of the Interior to control air emissions resulting from oil and gas activities on the OCS to the extent that these emissions do not significantly affect the air quality of any state. Pursuant to this, regulations controlling these activities have been developed and promulgated (30 CFR Part 250) and published in the *Federal Register* (45 FR 15128) of March 7, 1980 and are administered by USGS. The effective date of the aforementioned regulations is June 6, 1980.

b. Oil Spill Prevention and Mitigation

Prevention and mitigation of oil spills is, and historically has been, a prime consideration in OCS resource management. Actions taken by the Department of the Interior include issuance of OCS Orders, mapping of existing pipelines and platforms in developed areas, and sponsorship of oceanographic studies leading to circulation models that will provide input in spill trajectory models. Actions taken by EPA include their "pollution prevention program." The OCS Orders are discussed in Section I.C.3.b.(4), so will be only briefly addressed here. Additionally, under the Best Available and Safest Technologies (BAST) program developed by USGS, the OCS Platform Structural Verification program is designed to provide maximum assurance of the structural integrity of fixed or bottom-founded oil and gas platforms and to assure that new technology and engineering achievements are encouraged and accommodated in platform design, fabrication, and installation activities.

(1) Platform and Pipeline Mapping

Thousands of miles of pipelines within the OCS oil and gas producing areas exist in the Gulf of Mexico. These pipelines are subject to occasional damage and potential breaks resulting in oil spills caused by anchor dragging, mud slumping, etc. One factor contributing to these incidences is the lack of use of information detailing the locations of these pipelines. BLM's New Orleans OCS Office prepares maps at a scale of 1" = 1,000' detailing all major pipelines in the Gulf of Mexico (U.S.) which are subject to the pipeline permitting process. The Gulf of Mexico Regional Office of USGS maintains maps at a scale of 1" = 2,000' (1" = 1,000' in congested areas) which delineate all OCS pipelines. The U.S. Army Corps of Engineers publishes public notices of all permitted pipelines on the federal and state OCS in the Gulf of Mexico. Additionally, NOAA (NOS) publishes navigation charts delineating areas where pipelines exist, and the USCG published information regarding pipeline placement activities in the Notice to Mariners where a hazard to navigation exists and the information is readily available. The aforementioned maps plot locations of about 11,000 miles of pipelines in the federal sector of the Gulf of Mexico, plus an additional 1,000 miles of pipelines that transport OCS production through state waters.

(2) Circulation and Oil Spill Trajectory Modeling

An oil spill risk analysis model is available for the Gulf of Mexico. The results of this analysis are presented in Appendix D of the DEIS prepared for Sales 67 and 69. The oil spill risk analysis is provided to aid in the prediction and mitigation of major impacts from oil spills resulting from oil and gas activities on the OCS. A moderate amount of effort has been expended in studying the circulation in the Gulf of Mexico and the characteristics of the Loop Current in the eastern Gulf of Mexico. Despite these study efforts by various organizations, the physical oceanography in this region still remains poorly defined. BLM has recently entered into an interagency agreement with NASA for the processing of satellite-derived wave height, surface wind, and surface current fields information for the Gulf of Mexico. This data will be processed in bimonthly sets and will aid in the verification of Gulf of Mexico circulation models. This data should be available in late 1981 or early 1982. Other completed, ongoing, or proposed studies will contribute to a data base for circulation modeling purposes. When the aforementioned studies are completed and validated and shelf and deep ocean circulation models are available, mitigation measures can be planned and instituted before the occurrence of actual oil spills in order to alleviate any subsequent environmental consequences.

(3) EPA Oil Pollution Prevention Program

EPA administers a program entitled "Oil Pollution Prevention" to prevent oil discharges from onshore or offshore facilities other than transportation-related facilities. Such facilities include those involved in drilling, producing, gathering, storing, processing, refining, distributing, or consuming oil or oil products. The primary instrument of this program is a Spill Prevention Control and Countermeasure Plan (SPCCP) which must be prepared by owners or operators of affected facilities. Guidelines for preparation of these plans are provided by EPA (40 CFR Part 112) for the various types of facilities.

(4) U.S. Geological Survey OCS Operating Orders

OCS Operating Order Nos. 2, 5, and 8, with their references to API Recommended Practices and Standards, contain guidelines for assuring safe operations. Order Nos. 2 and 5 include statements requiring use of "best available and safest technologies" for drilling operations (Order No. 2) and production safety systems (Order No. 5) in accordance with requirements of the OCS Lands Act Amendments of 1978. OCS Order No. 8 (Platform and Structures) includes requirements for verification of design acceptability in compliance with structural standards devised to assure safe operation under all environmental loading forces at the installation site. Environmental forces to be considered include unstable seafloor conditions, storms, earthquakes, tsunamis, hurricanes, and normal wind and wave forces.

(5) Other Oil Spill Prevention Regulations

In addition to the above-cited efforts, the U.S. Coast Guard has limited jurisdiction concerning discharge of oil by marine vessels under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), commonly called the Clean Water Act. This act prohibits discharge of oil into territorial waters of the U.S. (within three miles of shore) by all vessels and also provides jurisdiction over U.S. flag vessels within the contiguous zone (within 12 miles of shore). Vessels discharging oil are liable for cleanup costs should the oil enter territorial waters regardless of their distance from shore at the time of discharge or registry.

Lastly, EPA has jurisdiction over discharges of oil associated with offshore ports, as per the Deepwater Port Act of 1974 (33 U.S.C. 1501, et seq.).

c. Oil Spill Response Measures

Contingency plans for timely response to oil spills is required of the federal government by the National Oil and Hazardous Substances Pollution Contingency Plan and of industry OCS oil and gas operators by USGS Operating Order No. 7.

(1) National Oil and Hazardous Substances Pollution Contingency Plan

To implement the Federal Water Pollution Control Act (FWPCA), the President's Council on Environmental Quality developed the National Oil and Hazardous Substances Pollution Contingency Plan. This plan was promulgated in final revised version and printed in the *Federal Register* (45 FR 17832) on March 19, 1980. The purpose of the plan is to provide for a coordinated and integrated response by agencies of the federal government to protect the environment from damaging effects of pollution discharges. The actual objectives of the Plan are to provide for efficient, coordinated, and effective action to minimize damage from oil and hazardous substances, including containment, dispersal, and removal. Provisions to accomplish these objectives include: (1) assignment of duties and responsibilities among federal agencies in coordination with state and local agencies; (2) identification, procurement, maintenance, and storage of equipment and supplies; (3) establishment or designation of a strike force to provide necessary services to carry out the Plan and establishment, at major ports, of trained and equipped emergency task forces; (4) a system of surveillance and reporting designed to insure the earliest possible notice of discharges of oil and hazardous substances to the appropriate federal agency; (5) establishment of a national center to provide coordination and direction for operations in carrying out the Plan; (6) procedures and techniques to be employed in identifying, containing, dispersing, and removing oil and hazardous substances; (7) a schedule, prepared in cooperation with the states, identifying dispersants and other chemicals, if any, that may be used in carrying out the Plan; (8) a system whereby the affected state(s) may be reimbursed for reasonable costs incurred in the removal of spills; (9) a procedure for coordinating scientific support of cleanup operations, assessment of damage after a spill, and research efforts; and (10) a system of referral and appeal of decisions of the Regional Response Teams and On-Scene Coordinators. Affected states are actively involved in development of the contingency plan and may be reimbursed for spill cleanup costs. There appears to be no provision, however, for direct funding to the states for development of containment or cleanup capabilities.

The FWPCA establishes EPA and the Coast Guard as enforcing agencies. These agencies have the authority and the capacity to marshall the nation's capability to combat an oil spill. They also share the responsibility to chair the Regional Response Teams established under the Plan. The Coast Guard's Gulf Strike Team, based at Bay St. Louis, Mississippi, is equipped with current state-of-the-art equipment designed to contain and cleanup oil in 5-foot seas, 20-knot winds, and 1.5-knot currents; however, this gear has been proven effective in 10-foot seas and 40-knot winds. The strike team has the capability to deploy equipment and personnel within hours of notification of a spill.

(2) USGS Order No. 7 (Pollution Prevention and Control)

USGS Order No. 7 requires that the operator submit an oil spill contingency plan to the USGS Deputy Conservation Manager prior to approval of permit application for conducting operations. This plan must be reviewed annually.

The plan must contain assurances that full response capability is known and can be committed during an oil spill situation, including specification of appropriate equipment and materials, their availability, and time needed for deployment. The plan must also include provisions for varying degrees of response effort depending on the severity of the discharge, and provisions must be established for early detection and timely notification to responsible agencies and persons of a spill as well as specific response actions including identification of a trained, prepared, and available response operating team, predesignation of an oil discharge response coordinator, preplanned location for an oil discharge response operations center, and provisions for disposal of recovered spilled material.

A group of about 63 companies (membership varies from time to time) has formed a cooperative, Clean Gulf Associates (CGA), to provide oil spill containment and cleanup equipment for use by member companies in the Gulf and coastal waters, to maintain equipment at strategic locations in a state of 24-hour readiness, and to evaluate technological advances for possible inclusion in their equipment stockpile. The cooperative has established bases of operation at Venice, Grand Isle, Houma, Intracoastal City, and Cameron, Louisiana, and at Galveston and Rockport, Texas. Additional bases located in Panama City and Bradenton, Florida, are activated when oil and gas activities occur offshore Florida. CGA has contracted with Haliburton Services Company to maintain equipment and to coordinate response to a spill incident. Member companies base their individual oil spill contingency plans on the CGA plan and supplement it as appropriate for their individual operations.

A memorandum of understanding between the Departments of the Interior and Transportation outlines the respective responsibilities of USGS and the Coast Guard regarding the supervision of abatement, containment, and cleanup efforts required by this OCS Order. Essentially, USGS is responsible for the coordination and direction of abatement measures, and the Coast Guard is responsible for containment and removal operations.

d. Offshore Oil Pollution Compensation Fund

The Offshore Oil Pollution Compensation Fund, established by Title III of the OCS Lands Act Amendments of 1978, provides for cleanup costs and damages resulting from spills originating at OCS offshore facilities or surface vessels transporting oil from an offshore facility. The fund is generated by fees on OCS-produced oil (3 cents per barrel produced) and recompensed by claims against liable operators or owners of the facilities responsible for spills. The fund is to be maintained at a level of no less than $100,000,000 and no more than $200,000,000. Claims against the fund may be made for costs of spill cleanup and for damages caused by the spill.

e. Coastal Energy Impact Program

In the early 1970's, concern was expressed that accelerated energy exploration and development was having and would continue to have negative effects on local economies, social patterns, and the environment, particularly in the coastal areas. This concern was translated into the Coastal Energy Impact Program (CEIP), Section 308 of the Coastal Zone Management Act Amendments of 1976. Since its establishment, CEIP has awarded millions of dollars in grants and loans, under certain conditions, to affected coastal states to prevent or mitigate the adverse impacts of OCS energy development. At the present time, however, future funding for CZM programs is uncertain due to national goals and priorities.

Under the CEIP program, several types of grants or loans are available and include OCS Formula Grants, Environmental and Recreational Loss Grants, Planning Grants and Credit Assistance. In summary, OCS Formula Grants can pay up to 100% of planning and development costs for new or improved public services and facilities resulting from OCS oil and gas activity, such as police and fire protection, schools, roads, docks, water supply, hospitals, etc. Environmental grants aid in preventing, reducing, or repairing damage or loss to valuable environmental or recreational resources. Planning grants can be used for resource inventories, studies for social and environmental consequences of new or expanded facility sitings, and other energy activities affecting land use and transportation plans in the coastal zone. Credit assistance can be either in loans or guarantees for building new public facilities or, on rare occasions, to provide service for a short time period. Repayment assistance is available when local governments cannot meet CEIP credit assistance obligations because expected energy activity revenues did not materialize.

The OCSLA Amendments of 1978 (Public Law 95-372) amended the CEIP program by adding the OCS State Participation Grant Program under new Section 308(c)(2) of the CZMA to allow coastal states to carry out their responsibilities under the OCS Lands Act. The fund provides up to 80% federally-funded grants to coastal states likely to be affected by OCS energy activity. The grants are to be used to cover the costs of participating in policy-making, planning, and managerial decisions relating to the development of OCS oil and natural gas resources; they are not to be used to cover any of the site specific planning, construction, or property acquisition costs provided for in other provisions of the CEIP. These grants are authorized at $5 million a year for each fiscal year 1979 through 1983.

In order to be eligible for these grants, however, certain criteria prevail: a coastal state must have a management program which has been approved under Section 306; is receiving a grant under Sections 305(c) or (d); or, in the judgment of NOAA's Assistant Administrator, is making satisfactory progress toward the development of a management program which is consistent with the policies set forth in Section 303. The governor shall designate the state agency or entity that is to be the applicant. Local and regional government units may apply for assistance under this program from their designated state agency.

It should be noted that, all the above notwithstanding, the entire CEIP program and concept may be eliminated in the FY 82 budget.

f. Fishermen's Contingency Fund

Final regulations (50 CFR Part 296) for the implementation of Title IV of the OCSLAA of 1978 were published in the Federal Register on January 24, 1980, 45 FR 6062. The OCSLAA of 1978 established this fund to compensate commercial fishermen for actual and consequential damages including loss of profit due to damage or loss of fishing gear by various materials and items associated with oil and gas exploration, development, or production on the OCS.

As required in the Act, nine area accounts have been established—five are in the Gulf of Mexico, one in the Pacific, one in Alaska, and two in the Atlantic. The five Gulf area accounts cover the same areas as the five Gulf USGS districts. Each area account is initially funded at $100,000 and cannot exceed this amount. The account is initiated and maintained by assessing holders of leases, pipeline rights-of-way and easements, and exploration permits. These cannot be assessed for more than $5,000 in any calendar year.

Generally, the claims eligible for compensation are as follows:

(1) the damage or loss must be suffered by a commercial fisherman; and

(2) any actual or consequential damage (including loss of profits) due to damage or loss of fishing gear caused by items associated with oil and gas activities. Damage or loss that occurs in non-OCS waters may be eligible for compensation if the item causing the damage or loss was associated with OCS oil and gas activities.

Damage or losses ineligible for compensation are generally as follows:

(1) damage or losses caused by items that are attributable to a financially responsible party;

(2) damage or losses caused by negligence or fault of the commercial fishermen;

(3) occurrences before September 18, 1978;

(4) claim of damage to or loss of fishing gear is more than the replacement value of the fishing gear;

(5) claims for loss of profits in excess of 6 months unless supported by records of the claimant's profits during the previous 12 months;

(6) any portion of damages claimed that will be compensated by insurance;

(7) if the claim is not filed within 60 days of the discovery of the damage or loss; and

(8) the damage or loss was caused by a natural obstruction or an obstruction unrelated to OCS oil and gas activities.

There are several requirements for filing claims, including a report within five days after the discovery of the damage or loss, stating among other things the location of the obstruction. This 5 day report is required to gain presumption of causation. A detailed claim form must be filed within 60 days of the discovery of the loss or damages. The specifics of this claim are contained in the *Federal Register* referenced at the beginning of this section. The claimant has the burden to establish all the facts to demonstrate the eligibility for the compensation, including the identity or nature of the item which caused the damage or loss and that the item is associated with OCS oil and gas activities.

Damages or losses are presumed to be caused by items associated with OCS oil and gas activities provided the claimant establishes that:

(1) the commercial fishing vessel was being used for commercial fishing and was located in an area affected by OCS oil and gas activities;

(2) the five-day report was filed;

(3) no record of an obstruction in the immediate vicinity is in the most recent NOAA/NOS nautical charts or weekly Notice to Mariners; and

(4) no proper surface marker or lighted buoy marked the obstruction.

Damage or losses occurring within a one-quarter mile radius of obstructions recorded on charts or listed in the Notice to Mariners or properly marked is presumed to involve the recorded obstruction.

This fund is being administered by the Financial Services Division, National Marine Fisheries Service, NOAA. This fund should mitigate most losses suffered by commercial fishermen due to OCS oil and gas activities.

g. Miscellaneous Mitigation Considerations

With many marine recreational fishermen directly affected by pervasive oil and gas development in the central Gulf of Mexico region, BLM is considering the development of marine recreational maps which depict coastal and marine public interest areas, as well as oil and gas developments. The maps would be designed to assist the offshore angler in locating and accessing marine destination sites and facilities while providing information which would encourage safe recreational use of the OCS. In cooperation with NMFS, BLM is also evaluating the potential of establishing a program aimed at retaining selected obsolete oil and gas structures in the marine environment when significant public value can be realized.

D. Administrative Events Leading to the Proposal

1. Legal and Administrative Background

In 1953 the Congress declared that submerged lands of the continental shelf which extended seaward of a state (usually from the three-mile limit of the territorial seas) were areas of federal jurisdiction. The OCS Lands Act (67 Stat. 462) established exclusive federal jurisdiction over the exploration, development, and management of mineral resources located there. It also empowered the Secretary of the Interior to formulate regulations so that provisions of the Act might be met.

Subsequent to the passage of the OCS Lands Act of 1953, the Secretary of the Interior designated BLM as the administrative agency for leasing submerged offshore lands (43 CFR 3300) and USGS for supervising any operations resulting from the proposed sale (30 CFR 250). DOI formulated three major goals for the comprehensive management program of marine minerals:

(a) the orderly and timely development of marine mineral resources to meet the energy demands the nation;

(b) the protection of the marine and coastal environment; and

(c) the receipt of a fair return for the leased mineral resources.

These leasing objectives are based on legislative mandates as explained below:

(1). Orderly and timely resource development is based on an approved 5-year planning schedule of proposed OCS lease sales (Figure I-10) evolved around the express intent of meeting the domestic demand for oil and gas, as well as meeting our national goal of decreasing our dependence on foreign resources. An FEIS for the most recent schedule was published in January 1980 and covers the period March 1980-February 1985. The OCSLA gives the Secretary the authority to grant leases to the highest qualified bidder(s) on the basis of sealed competitive bids.

(2). The policy of protecting the marine and coastal environment is a direct outgrowth of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). This Act required that all federal agencies shall utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences in any planning and decisionmaking which may have an impact upon the environment. More recently, CEQ published regulations, effective July 30, 1979, which established uniform procedures for implementing the procedural provisions of NEPA. The scoping process seeks to identify the scope and significance of important issues associated with a proposed federal action through interface with federal, state, and local agencies, the public, and any interested individual or organization prior to the development of an impact statement as a means to assure that important issues are addressed in the EIS. (See Section I.B. for more detailed information.)

BLM's responses to these requirements include the formation of Environmental Assessment Teams, interrelationships with other projects and proposals (Section I.E.), development of EIS's, and sponsorship of contract studies (Section I.F.). These studies include environmental benchmark studies, monitoring, and special studies designed to provide information for assessing the effect of oil and gas operations.

(3). Receipt of a fair return has its basis in two separate mandates. United States Code 31, Sec. 483(a) obligates the federal government to obtain a fair return for public lands that are sold or leased. This is further implemented within the Executive Branch by the Office of Management and Budget, Circular A-25.

2. Regulatory Framework

a. Legal Mandates and Authority

(1) OCS Lands Act

The Outer Continental Shelf Lands Act of 1953 (67 Stat. 462), as amended in 1978 (P.L. 95-372; 92 Stat. 629), established federal jurisdiction over submerged lands on the OCS seaward of state boundaries (generally three geographic miles seaward of the coastline). Under the OCS Lands Act, the Secretary of the Interior is responsible for the administration of mineral exploration and development of the OCS. The Act empowers the Secretary to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the Act.

FINAL 5-YEAR OCS OIL & GAS LEASING SCHEDULE

JUNE 1980

PROPOSED SALE AREA	PROPOSED DATE	1980												1981											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A62 Gulf of Mexico	9/80		F			P	S_C	R	N	S															
55 Gulf of Alaska	10/80			F		P		S_C	R	N	S														
62 Gulf of Mexico	11/80		F				P		S_C	R	N	S													
53 Central N. Calif.	5/81				E		H			F	P				S_C	R	N	S							
RS-1 Reoffering Sale	6/81													P		S_C	R	N	S						
A66 Gulf of Mexico	7/81							E		H			F		P		S_C	R	N	S					
56 South Atlantic	8/81							E		H				F		P		S_C	R	N	S				
60 Cook Inlet	9/81								E		H				F		P		S_C	R	N	S			
66 Gulf of Mexico	10/81							E		H			F					P		S_C	R	N	S		
59 Mid-Atlantic	12/81											E		H				F		P		S_C	R	N	S
67 Gulf of Mexico	3/82	C		D		T										E		H			F		P		S_C
RS-2 Reoffering Sale	6/82																								
68 Southern California	6/82		D			T												E		H				F	
69 Gulf of Mexico	8/82	C		D		T										E		H			F				
57 Norton Basin	9/82		T																E				H		
52 North Atlantic	10/82		D				T															E		H	
70 St. George Basin	12/82		T																				E		
71 Beaufort Sea	2/83			T																					E
72 Gulf of Mexico	3/83													C		D		T							
61 Kodiak	4/83									C		D			T										
73 California	5/83											C		D			T								
RS-3 Reoffering Sale	6/83																								
74 Gulf of Mexico	9/83													C		D		T							
75 No. Aleutian Shelf	10/83					C			D				T												
76 Mid-Atlantic	11/83																	C		D			T		
78 South Atlantic	1/84															C			D				T		
79 Gulf of Mexico	3/84																								
RS-4 Reoffering Sale	5/84																								
80 California	6/84																					C		D	
81 Gulf of Mexico	7/84																								
82 North Atlantic	10/84																								
83 Navarin Basin	12/84																		C			D			
84 Gulf of Mexico	1/85																								
☆85 Chukchi Sea	2/85																			C			D		
86 Hope Basin	5/85																					C			D
RS-5 Reoffering Sale	6/85																								

PROPOSED SALE AREA	PROPOSED DATE	1982												1983											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A62 Gulf of Mexico	9/80																								
55 Gulf of Alaska	10/80																								
62 Gulf of Mexico	11/80																								
53 Central N. Calif.	5/81																								
RS-1 Reoffering Sale	6/81																								
A66 Gulf of Mexico	7/81																								
56 South Atlantic	8/81																								
60 Cook Inlet	9/81																								
66 Gulf of Mexico	10/81																								
59 Mid-Atlantic	12/81																								
67 Gulf of Mexico	3/82	R	N	S																					
RS-2 Reoffering Sale	6/82		P		S_C R	N	S																		
68 Southern California	6/82	P		S_C	R	N	S																		
69 Gulf of Mexico	8/82			P		S_C	R	N	S																
57 Norton Basin	9/82		F		P		S_C	R	N	S															
52 North Atlantic	10/82			F		P		S_C	R	N	S														
70 St. George Basin	12/82	H				F		P		S_C	R	N	S												
71 Beaufort Sea	2/83			H				F		P		S_C	R	N	S										
72 Gulf of Mexico	3/83			E		H			F		P		S_C	R	N	S									
61 Kodiak	4/83			E			H			F		P		S_C	R	N	S								
73 California	5/83				E		H				F		P		S_C	R	N	S							
RS-3 Reoffering Sale	6/83														P		S_C R	N	S						
74 Gulf of Mexico	9/83			E		H			F								P		S_C	R	N	S			
75 No. Aleutian Shelf	10/83								E			H				F		P		S_C	R	N	S		
76 Mid-Atlantic	11/83										E		H				F		P		S_C	R	N	S	
78 South Atlantic	1/84											E			H				F		P		S_C	R	N
79 Gulf of Mexico	3/84	C		D		T										E		H			F		P		S_C
RS-4 Reoffering Sale	5/84																								
80 California	6/84			T														E		H				F	
81 Gulf of Mexico	7/84	C		D		T										E		H			F				
82 North Atlantic	10/84				C		D			T												E		H	
83 Navarin Basin	12/84	T																					E		
84 Gulf of Mexico	1/85											C		D		T									
☆85 Chukchi Sea	2/85		T																						E
86 Hope Basin	5/85				T																				
RS-5 Reoffering Sale	6/85																								

PROPOSED SALE AREA	PROPOSED DATE	1984												1985											
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
A62 Gulf of Mexico	9/80																								
55 Gulf of Alaska	10/80																								
62 Gulf of Mexico	11/80																								
53 Central N. Calif.	5/81																								
RS-1 Reoffering Sale	6/81																								
A66 Gulf of Mexico	7/81																								
56 South Atlantic	8/81																								
60 Cook Inlet	9/81																								
66 Gulf of Mexico	10/81																								
59 Mid-Atlantic	12/81																								
67 Gulf of Mexico	3/82																								
RS-2 Reoffering Sale	6/82																								
68 Southern California	6/82																								
69 Gulf of Mexico	8/82																								
57 Norton Basin	9/82																								
52 North Atlantic	10/82																								
70 St. George Basin	12/82																								
71 Beaufort Sea	2/83																								
72 Gulf of Mexico	3/83																								
61 Kodiak	4/83																								
73 California	5/83																								
RS-3 Reoffering Sale	6/83																								
74 Gulf of Mexico	9/83																								
75 No. Aleutian Shelf	10/83																								
76 Mid-Atlantic	11/83																								
78 South Atlantic	1/84	S																							
79 Gulf of Mexico	3/84	R	N	S																					
RS-4 Reoffering Sale	5/84	P		S_C R	N	S																			
80 California	6/84	P		S_C	R	N	S																		
81 Gulf of Mexico	7/84		P		S_C	R	N	S																	
82 North Atlantic	10/84			F		P		S_C	R	N	S														
83 Navarin Basin	12/84	H				F		P		S_C	R	N	S												
84 Gulf of Mexico	1/85	E		H			F		P		S_C	R	N	S											
☆85 Chukchi Sea	2/85			H				F		P		S_C	R	N	S										
86 Hope Basin	5/85			E			H				F		P		S_C	R	N	S							
RS-5 Reoffering Sale	6/85														P		S_C R	N	S						

Cecil D. Andrus
Secretary of the Interior

March 3, 1849

C - Call For Nominations
D - Nominations Due
T - Tentative Tract Selection
E - Draft Environmental Statement

H - Public Hearing
F - Final Environmental Statement
P - Proposed Notice of Sale
S_C - State Comments Due

R - Energy Review
N - Notice of Sale
S - Sale

☆ The holding of the Chukchi Sale at this time is contingent upon a reasonable assumption that technology will be available for exploration and development of the tracts included in the sale.

Figure I-10

The Act, as amended, provides guidelines for implementing an OCS oil and gas exploration and development program. The basix goal of the Act is to expedite exploration and development of OCS minerals in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources of oil, and maintain a favorable balance of payments in the world trade. With respect to implementing a leasing program, this goal is constrained by the following considerations: (a) the receipt of fair and equitable return on oil and gas resources; (b) preservation and maintenance of competition; and (c) balancing orderly energy resource development with protection of the human, marine, and coastal environments.

The Secretary of the Interior has designated BLM as the administrative agency responsible for the leasing of submerged federal lands, and USGS for the supervision of offshore operations after lease issuance. Regulations administered by BLM govern the leasing of mineral deposits on the OCS and the granting of rights-of-way for pipelines (43 CFR Part 3300). Regulations administered by USGS govern the conduct of mineral operations which are contained in 30 CFR Part 250 and are supplemented by OCS operating orders on an area-specific basis.

Major requirements of the Act and its implementing regulations, many of which mitigate some of the possible adverse impacts resulting from OCS leasing and development, are as follows:

- In the enforcement of the safety, environmental, and conservation laws and regulations, the Secretary shall cooperate with the relevant departments and agencies of the federal government and affected states.
- The Secretary is authorized to suspend or temporarily prohibit an operation or activity pursuant to a lease or permit.
- The Secretary is authorized to cancel a lease or permit.
- The Secretary is authorized to issue regulations for unitization, pooling, and drilling agreements.
- The Secretary is authorized to issue regulations to prevent OCS operations from adversely affecting the national ambient air quality standards.
- The Secretary may cancel a nonproducing lease for the owner's failure to comply with any of the provisions of the Act, the lease, or regulations under the Act.
- The Secretary may initiate judicial proceedings to cancel a producing lease because of the owner's failure to comply with any of the provisions of the Act, the lease, or regulations under the Act.
- Rights-of-way may be approved under such regulations and upon such conditions as may be prescribed by the Secretary, assuring maximum environmental protection by utilization of BAST.
- Exploration must be undertaken pursuant to an approved exploration plan. No permit for drilling may be issued until all affected states with approved CZM plans have concurred or been presumed to concur with the consistency determination provided by the lessee.
- Geological explorations on unleased areas of the OCS shall be allowed only if such exploration will not be unduly harmful to aquatic life in the area, result in pollution, create hazardous or unsafe conditions, unreasonably interfere with other uses of the area, or disturb any site, structure, or object of historical or archaeological significance.

- Governors of the affected states may submit recommendations to the Secretary regarding the size, timing, or location of a proposed lease sale, or with respect to a proposed development and production plan.

- The Secretary is authorized to enter into cooperative agreements with the affected states for several purposes including, but not limited to, sharing of information; joint utilization of available expertise; joint planning, review, and permitting procedures; and the formation of joint surveillance and monitoring arrangements relevant to OCS operations, both onshore and offshore.

- The Secretary shall conduct a study of any area or region included in any oil and gas sale in order to establish information needed for assessment and management of environmental impacts on the human, marine, and coastal environments of the OCS and the coastal area which may be affected by oil and gas development in such area or region.

- Subsequent to the leasing and development of any area or region, the Secretary shall conduct additional studies to establish environmental information and shall monitor the human, marine, and coastal environments of such area or region.

- The Secretary shall consider relevant environmental information in making decisions, developing appropriate regulations and lease conditions, and issuing operating orders.

- In exercising their respective responsibilities, the Secretary and the Coast Guard shall require, on all new drilling and production operations and, wherever practicable, on existing operations, the use of BAST. The Secretary determines the economic feasibility of utilizing BAST. Wherever failure of equipment would have a significant effect on safety, health, or the environment, the Secretary shall require use of BAST unless he determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies.

- The holder of a lease or permit shall maintain all operations within such lease area or within the area covered by such permit in compliance with regulations intended to protect persons, property, and the environment on the OCS.

- The Secretary of the Interior, the Secretary of the Department in which the Coast Guard is operating, and the Secretary of the Army shall enforce safety and environmental regulations promulgated under the Act. The Secretary and the Coast Guard shall promulgate regulations for on-site inspections of OCS facilities.

- Any person having a valid legal interest which is or may be adversely affected may commence a civil action to compel compliance with the Act against any person, including the United States, for any alleged violation of any provision of the OCS Lands Act, or regulation promulgated thereunder, or terms of any permit or lease issued under the Act.

- The Attorney General or a U.S. attorney may institute a civil action for a temporary restraining order, injunction, or other appropriate remedy to enforce any provisions of the Act, regulation or order issued under the Act, or any terms of a lease, license, or permit issued under the Act.

- Prior to development and production of an oil and gas lease, the lessee shall submit a development and production plan to the Secretary for approval.

- The Secretary shall disapprove a development and production plan if:
    - the lessee fails to demonstrate he can comply with requirements of the Act or other applicable federal law;
    - activities described do not receive a consistency concurrence by a state with an approved CZM plan;
    - operations threaten national security or defense; or
    - (a) exceptional geologic conditions, exceptional values in the marine or coastal environment or other exceptional conditions exist, and that implementation of the plan would probably cause serious harm or damage to life, to property to any mineral deposits, ... or to the marine, coastal, or human environments; (b) the threat of harm or damage will not disappear or decrease to an acceptable extent within a reasonable period of time; and (c) the advantages of disapproving a plan outweigh the advantages of development and production.

- The Secretary shall not grant a license or permit for any activity in an exploration, development, or production plan affecting any land or water use in the coastal zone of a state with an approved CZM plan, unless the state concurs or can be presumed to concur with the consistency certification accompanying such plan.

- The Secretary shall, from time to time, review each development and production plan. If the review indicates that the plan should be revised to meet the requirements of Section 25 of the Act, the Secretary shall require such revision.

- The Secretary shall provide the affected states with information to assist them in planning for the onshore impacts of possible oil and gas development and production.

- The Secretary of Transportation shall administer the Offshore Oil Pollution Compensation Fund establishing compensation for injuries caused by oil discharge from an offshore facility or vessel.

- The Secretary of Commerce shall administer the Fishermen's Contingency Fund which provides compensation for damage to fishermen's gear or vessels resulting from oil and gas exploration, development, and production.

(2) Federal/State Coordination

The OCS Lands Act, as amended, provides a statutory foundation for the Department's policy of coordination of OCS activities with the affected states and, to a more limited extent, local governments. At each step of the procedures that lead to lease issuance, participation from the affected states and other interested parties is encouraged and sought. Below is a detailed discussion of coordination mechanisms requireed by the OCS Lands Act.

The Secretary of the Interior is required to invite and consider suggestions from the Governor of any affected states during preparation of any proposed leasing program prior to its publication in the *Federal Register*. The Secretary is required to provide a written response to any request from a Governor for modification of a proposed leasing program. State and local governments may comment directly on a proposed leasing program in its published form. The Secretary is obligated to establish procedures for review of proposed leasing and periodic consultation with state and local governments (Section 18 of the Act).

Within 60 days after notice of a proposed lease sale or receipt of a development and production plan, the Governor of any affected state may make recommendations to the Secretary with regard to the size, timing, or location of the proposed lease sale or development and production plan. If the Secretary determines that any such recommendations provide for a reasonable balance between the well-being of the citizens of the affected state and the national interest, he must accept them. The Secretary must also respond to the Governor in writing, giving his reasons for accepting, rejecting, or modifying the Governor's recommendations. The Secretary may enter into cooperating agreements with the affected States for purposes consistent with the Act and other applicable federal law (Section 19 of the Act).

When soliciting nominations for the leasing of lands within three miles of the seaward boundary of any coastal state, additional information is to be provided to the Governor of those states. The Governor must be informed of the identity of and schedule for the area proposed for leasing; the geographical, geological and ecological characteristics of the area within three miles of the seaward boundary; and estimate of oil and gas reserves in these areas; and any field, trap, or geologic structure thought to be located in these areas. After the close of the call period, the Governor is informed of any area which merits further consideration for leasing (Section 8(g) of the Act).

Under Section 25 of the Act, the Secretary must submit copies of development and production plans to the Governor of any affected states for review. The state then has 60 days to provide comments and recommendations to the Secretary. Section 11 of the Act and the regulations contained in 30 CFR 250.34 also require that any exploration plans submitted to the Secretary must be approved or disapproved within 30 days. Written comments from the Governor of any affected state will be considered prior to approval action if they are timely.

Under Section 26 of the Act, the Secretary must make available to the affected states a summary of data to aid them in anticipating possible onshore effects of OCS development and production. The summary includes estimates of oil and gas reserves in areas leased or to be leased, estimated size and timing of development, pipeline location, and the general location and nature of onshore facilities.

The Act also requires preparation and transmittal to each affected state of an index of all relevant actual or proposed programs, plans, reports, EIS's, tract nominations, and other lease sale information. On request, the Secretary must send copies of these documents to the affected state.

Pertinent regulations under the OCS Land Act, as amended, are those issued by BLM as to leasing operations and pipelines, and those of USGS as to exploration, development, and production operations. BLM regulations were published in the *Federal Register* of June 29, 1979 (44 FR 38268), effective July 30, 1979, amended November 24, 1980 (45 FR 77437). USGS regulations were published in final form on September 14, 1979 (44 FR 53685), on October 26, 1979 (44 FR 61886), effective December 13, 1979, as corrected on March 28, 1980 (45 FR 20464), and on March 7, 1980 (45 FR 15128). Also, on May 2, 1980 (45 FR 29280), rules on unitization wre published, effective June 30, 1980. 43 CFR 3320.2(d) provides that pursuant to Section 5(a) of the OCSLA, as amended, the Secretary may cancel a lease when:

(1) continued activity pursuant to such lease would probably cause serious harm or damage to life, property, any mineral, national security or defense, or to the marine, coastal or human environment;

(2) the threat of harm or damage will not disappear or decrease to an acceptable extent within a reasonable period of time; and

(3) the advantages of cancellation outweigh the advantages of continuing such lease or permit in force.

USGS OCS Orders supplement regulations governing drilling and producing operations as listed in Title 30, Part 250 of the Code of Federal Regulations. After leases are issued by BLM, USGS supervises the exploration, development, and production operations through periodic on-site inspections to insure that permittees, licensees, lessees, and operators comply with approved operating plans, DOI regulations, OCS Orders, lease terms, and environmental stipulations. Periodic reports filed by industry also keep USGS informed about the progress of operations. (See Section I.E.7. for a detailed description of activities.)

Regulations governing drilling and producing operations on the OCS are found in Title 30, Part 250 of the Code of Federal Regulations and are administered by the Conservation Division, USGS. They are supplemented by USGS OCS Orders which deal specifically with problems unique to a certain area.

OCS Orders applicable to the Gulf of Mexico and other areas were revised, published in the *Federal Register* of December 21, 1979 (44 FR 76212), and became effective January 1, 1980, covering Order Nos. 1, 2, 3, 4, 5, 7, 8, and 12. A synopsis of all OCS Orders is given below.

OCS Order No. 1. This order requires identification of the operator, block designation, and wellnumber on platforms, structures, wells, and mobile drilling units. It requires that the U.S. Coast Guard District Commander determine what aid-to-navigation devices are needed for subsea objects that are hazards to navigation or to the deployment of commercial fishing devices. It requires that equipment of sufficient size or of such a nature that it could be expected to interfere with commercial fishing gear, if dropped overboard, be marked, wherever practicable, with the owner's identification.

OCS Order No. 2. This order details drilling operation rules and permit requirements, including those for mobile drilling units (including fitness and ability to withstand oceanographic and meteorologic conditions). It includes criteria relative to well casing and cementing; blowout-preventer equipment; mud program; supervision, surveillance, and training; establishment of field drilling rules.

OCS Order No. 3. This order establishes plugging and abandonment procedures which have general application to all wells drilled for oil and gas. All casings, wellhead equipment, and pilings must be removed to a depth of at least five m (15 feet) below the ocean floor unless another depth is approved by the DCM.

OCS Order No. 4. This order sets forth criteria for demonstrating the capability of a well to produce paying quantities of oil or gas.

OCS Order No. 5. This order deals with production safety systems on all OCS platforms and structures, and regulates quality assurance, subsurface safety devices, and safety equipment. It requires plans, applications, and reports in the use of the best and safest technologies. Design, installation, and operation of pressure vessels, flow lines, and other safety equipment, as well as training, record keeping, failure reports, etc., are also regulated by this order.

OCS Order No. 6. (Proposed) This order sets specifications for workover procedures, including testing, and wellhead fitting, valves and casing heads. It relates to production operations only.

OCS Order No. 7. This order requires that the lessee prevent pollution of the ocean, prescribes certain pollution control measures, and prohibits disposal of any waste materials into the ocean that will create conditions which will adversely affect the public health, life, property, aquatic life, wildlife, recreation, navigation, commercial fishing, or other uses of the ocean. Disposal of waste materials is regulated by EPA pursuant to the Clean Water Act.

OCS Order No. 8. This order establishes requirements applicable to platform and structure design and installation. It requires consideration of environmental conditions which may contribute to structure damage. This order applies to production operations.

OCS Order No. 9. This order provides approval procedures for oil and gas pipelines on the OCS. All pipelines and related equipment must be designed and maintained with high-low pressure sensors, automatic shut-in valves, checkflow valves (to control backflow), and metering systems. The Order also requires adequate provisions for cathodic corrosion protection, trawling compatibility, hydrostatic testing, storm scour and other environmental stress in OCS pipelines. Procedures and schedules for regular inspection of pipelines along with recording of such inspections are stipulated.

OCS Order No. 10. This order relates specifically to sulphur drilling procedures regarding well casing and cementing, muds, and blowout prevention equipment. Specifics are given regarding drive or structural, conductor, and caprock casings; a general mud program is outlined for testing equipment and a monitoring system; and procedures are indicated for the installation and maintenance of blowout preventers and related well control equipment.

OCS Order No. 11. This order sets requirements for maximum efficient recovery rate for oil and gas from a lease and establishes production rates. It also provides procedures to shut-in wells, due to over-production or storms, and for producibility tests. It applies to production only.

OCS Order No. 12. This order sets forth requirements for public inspection of records. It details what information, which the lessee provides to USGS, is considered public and how this information should be transmitted to the USGS in order for it to be made publicly available.

OCS Order No. 13. This order specifies procedures for assuring the accurate measurement of oil and gas production and for commingling production from different leases or operators. The requirements will permit accurate determinations of government royalties and an orderly transfer of production between parties.

OCS Order No. 14. This order establishes guidelines for the approval of suspensions of production and provides for diligent development of oil and gas resources. The intent of the order is to allow sufficient time for proper lease development while prohibiting unnecessary delays in the exploitation of OCS resources. The environmental impacts of OCS development are minimized by proceeding in an orderly, well planned fashion.

Copies of the revised Orders, and maps indicating the jurisdictional boundaries, are available from the Conservation Manager, Gulf of Mexico Region, U.S. Geological Survey, P. O. Box 7944, Metairie, Louisiana 70010. Order Nos. 1, 2, 5, and 7 were again revised, published August 18, 1980 (45 FR 55126), and became effective September 15, 1980. OCS Orders are under continual review for improvement and subject to future revisions through the administrative process.

b. Authorities of Other Federal Agencies

Besides BLM and USGS, other federal agencies are involved in the regulatory process of OCS oil and gas operations.

The Corps of Engineers has permitting responsibility for any structure or any other work done in, or affecting U.S. navigable water, as well as construction of artificial islands, fixed structures, and other installations on the OCS. The Coast Guard requires permits to insure that these structures and installations are properly marked and have lighted aids to navigation.

The Port and Waterways Safety Act (33 U.S.C. 1221), as enlarged by the Port and Tanker Safety Act of 1978, gave the Coast Guard new authority to establish "port access routes" in U.S. coastal waters. Regulations for a designated port access route may prohibit or restrict placement of drilling or production platforms within or adjacent to vessel traffic lanes. Before a port access route can be designated, the Coast Guard must study the need for such routes. The area of the proposed sales will be studied under the Port Access Route Study (PARS), and the Coast Guard will keep BLM informed of developments. In addition, they regulate offshore structures and artificial islands with respect to safety, including vessels involved in OCS operations.

The Port and Tanker Safety Act of 1978 also contains standards which tank vessels must meet. Subsection (7)(m) of Section 5 will require a crude oil tanker which is engaged in the transfer of oil from an offshore exploitation or production facility on the OCS of the U.S., not later than June 1, 1980, be equipped with segregated ballast tanks or may operate with dedicated clean ballast tanks or special ballast arrangements. The Coast Guard published a notice of proposed rulemaking implementing this section of the Act in the *Federal Register* of May 1, 1980.

A memorandum of understanding regarding pipeline safety regulations was signed in May 1976 between the Secretary of the Interior and the Secretary of Transportation which specified each agency's responsibilities and joint responsibilities for inspection, enforcement, and coordination. Pipeline safety is ultimately regulated by the Materials Transportation Bureau within the Department of Transportation.

The Department of Energy's responsibilities include regulating the use of pipelines on the OCS, setting the wellhead price of OCS-produced gas, and establishing production rates for all federal leases as well as preparing regulations on bidding systems to foster competition.

The Office of Coastal Zone Management of NOAA administers the Marine Sanctuary Program. Specific sanctuary regulations may provide somewhat different regulations and restrictions on oil and gas operations within sanctuaries than do USGS regulations.

The Federal Water Pollution Control Act Amendments (FWPCA) of 1972 established a National Pollution Discharge Elimination System (NPDES) (40 CFR 125) which is administered by EPA. EPA has issued several NPDES permits for oil and gas operations in the Gulf of Mexico and has just issued final General NPDES permits for the Gulf of Mexico offshore Texas and Louisiana (46 FR 20284-20298, April 3, 1981) which apply to all areas except a few specifically excluded areas of special environmental concern. EPA issued guidelines applicable to NPDES permits effective November 3, 1980 (45 FR 65942, October 3, 1980).

USGS OCS Order No. 7 stipulates that operations on the OCS must comply with the FWPCA. The Clean Water Act amended the FWPCA and gave the Coast Guard the authority to approve the procedures and equipment for the transfer of oil from vessel to vessel and between onshore and offshore facilities and vessels. They also conduct pollution surveillance patrols to detect oil discharges within territorial and contiguous waters. USGS performs surveillance for oil spills and discharges along pipeline routes.

The Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407, 50 CFR Part 216) establishes a national policy designed to protect and conserve marine mammals and their habitats. The Act specifically prohibits the harassing, hunting, capturing, or killing of any marine mammal unless otherwise exempted under provisions of the Act. The Marine Mammal Commission is responsible for advising federal agencies on the protection and conservation of marine mammals. The Commission has a Committee of Scientific Advisors which provides advice on actions needed to fulfill the purposes of the Act. Authority for administering the Act has been delegated to both the Department of Commerce, NMFS, which is responsible for all cetaceans and pinnipeds (except walrus), and to the Department of the Interior, FWS, which is responsible for walrus, sea otters, manatees, and dugongs. DOI is responsible for determining if OCS oil and gas activities will threaten marine mammal populations or violate any other provisions of the Act.

The Endangered Species Act of 1973 (16 U.S.C. 1531-1543), as amended, establishes a national policy designed to protect and conserve threatened and endangered species and the ecosystem upon which they depend. This Act is administered by FWS and NMFS. Section 7 of the Act, governing interagency cooperation, requires federal agencies to consult with FWS and NMFS to insure that their actions do not jeopardize the continued existence of a threatened or endangered species and/or result in adverse modification or destruction of their critical habitat.

The Federal Energy Regulatory Commission (FERC), an independent agency within DOE, received the authority to issue certificates of public convenience and necessity for proposed projects involving the transportation or sale of natural gas in interstate commerce under the Natural Gas Act. All natural gas produced from the OCS is considered to be interstate and, therefore, is subject to FERC jurisdiction. The Natural Gas Act, NEPA, and the OCSLA Amendments of 1978 grant authority or require that the FERC investigate the environmental effects of a proposed offshore project as well as the potential gas reserves, the need for this gas, and the availability of capital to develop this resource. Also, the FERC is primarily responsible for administering and enforcing compliance with the Natural Gas Policy Act (NGPA) of 1978 (92 Stat. 3350). As applied to OCS matters, it provides new wellhead pricing controls for certain natural gas produced from the OCS.

Military exercises and training operations are periodically conducted in the Gulf by the U.S. Air Force and U.S. Navy. Aircraft, gunnery, missile firings, and submarine exercises may be conducted over areas proposed for leasing in these proposed sales.

All federal agencies are required under Section 106 of the National Historic Preservation Act to ensure that federal, federally-assisted, and federally-licensed undertakings affecting properties included in or eligible for inclusion in the National Register of Historic Places be submitted by a federal agency to the Advisory Council on Historic Preservation for review and comment prior to the agency's approval of any such undertaking. In order to determine if properties eligible for the National Register will be affected by a proposed action, E.O. 11593 requires federal agencies to locate, inventory, and nominate properties under their jurisdiction or control to the National Register.

E. Interrelationship with Other Programs and Post-sale Activity Coordination

1. Previous Gulf of Mexico Sale Activities

The proposed action must be viewed as it relates to the overall picture of continuous oil and gas development in the Gulf of Mexico, beginning in 1938 with the discovery of the Creole oil field to the projection for future activities as indicated by DOI's 5-Year Proposed OCS Oil and Gas Leasing Schedule June 1980. This schedule lists 11 proposed sales for the Gulf during that 5-year period (Figure I-9).

Industry activities are directly correlated to, and affected by, DOI's leasing schedule which is used as a planning tool relative to employment, facility sitings, investments, etc. Hundreds of industries, both large and small, employing many thousands of people have evolved over the years into a complex infrastructure of onshore facilities and offshore production structures. The onshore infrastructure comprises hundreds of facilities, some of which include gas processing plants, refineries, support and servicing industries, and fabrication plants. The number of offshore production structures resulting from lease sales are estimated to be approximately 3,500, with 3,100 offshore Louisiana. During 1979, 135 platforms were installed and 34 were removed from the OCS. According to the October issue of Ocean Construction Locator, there are 76 platforms under construction in the Gulf of Mexico and another 51 are planned or being designed.

The BLM has issued 3,119 leases in conjunction with past Gulf lease sales for a cumulative total acreage of approximately 14,637,469 acres. Sales 67 and 69 total approximately 2,458,827 acres and it is estimated that one-half of this acreage will be leased when the sales are held in March and August 1982. This estimate is based on an average 50% leases resulting from lease offerings of the past 11 of 12 sales held in the Gulf; however, the last sale (Sale 62) resulted in 90% leasing. As of October 1, 1980, there were 1,871 active leases, of which 1,098 are in production. USGS Open File Report 80-1312 (Hewitt, Knipmeyer, and Schluntz, 1980) estimates that there are about 2.88 billion barrels of oil and 38.0 trillion cubic feet of gas in unproduced reserves on leased Gulf of Mexico tracts. This is the latest information available at the time of this writing.

According to information obtained from USGS's computer pipeline data base, there are a total of 5,214 pipeline permits which have been issued, and this has resulted in a network of approximately 12,400 miles of pipelines.

Even though several lease sales have occurred, oil production in the Gulf of Mexico has been declining. A major contributing factor has been the decreasing productivity of older fields as reserves are depleted and the failure of new oil reserve additions to keep pace with production. As this reduction has occurred, much of the equipment, transportation facilities, and personnel of the larger industries has been diverted to newer areas of activity. If production continues to decline, there may be an economic hardship on some of the associated smaller industries which provide ancillary services to the larger companies. However, since there is a direct relationship in overall operations to the leasing schedule, it is anticipated that production trends will be reversed because of the increase in the number of proposed Gulf sales, the increase in technological recovery methods, and the national priority to increase domestic production. Until such time as these factors reverse the current production trends, the present rate of decline may continue for an indefinite period of time. In that event, existing pipelines can be used for new production areas, adjacent to or further from shore, reducing the number of pipelines necessary to transport production from new areas to shore. This latter event has already been utilized in some areas offshore Louisiana. Likewise, some reduction in the number of new onshore facilities has occurred and existing facilities and personnel are being utilized. It should be noted that with the overlap of sales in the same areas, it has oftentimes been possible to utilize the existing infrastructure with few new additions. It should be further noted that while it is true that oil production has been decreasing, gas production has been increasing in the Gulf, especially off the coast of Texas. This increased production has also utilized some of the existing network of pipelines dependent upon the integrity of the lines, ownership rights, and location of production sites. Two new major pipelines have been recently permitted and will extend the overall pipeline carrying capability. To date there has been no significant increase in the number of facilities related to gas processing.

It should be noted that Tract 67-105 (Main Pass Area, South and East Addition, Block 254) has been previously leased and that there is a platform in place in the block. The previous lessee received special permission not to remove the platform while a search was made to see if an agency or group was interested in taking over responsibility for the platform, thus, saving the previous lessee the expense of removing it. EPA has expressed an interest in using the platform to burn toxic wastes and has initiated a study on the feasibility of doing so. Reportedly, a DEIS on such a proposal will be published in late 1981. Should this tract be leased in proposed Sale 67, the lease would be subject to the presence of the structure, which would not be under the control of the new lessee. An agreement of use and responsibility would probably be worked out among DOI, the previous lessee, the new lessee, and, presumably, EPA.

2. Coastal Zone Management

Seven of the nine largest metropolitan areas in the U.S. exist within the coastal zone, and more than 50% of the population lives within 50 miles of the coastline. This has caused a diversity of increasing multiple use pressures, such as recreation, plant sitings, community development and services, and expansion of port and marine facilities. Because of the interface between coastal resources and land use conflicts, the Coastal Zone Management Act of 1972 (16 U.S.C. 1451-1464) was created as a combined federal/state land management partnership. The Act, administered by the Department of Commerce, NOAA, set major goals for the protection of natural resources and historic and cultural resources, provided for increased recreational access, management of coastal development, and coordination and streamlining of federal and state decisions affecting the coastal resources.

Section 305 authorizes the Secretary of Commerce to issue grants to assist any coastal state in the development of a management program for land and water resources in its coastal zone with the objective of each state determining its own management plan particular to its own needs. This development has sometimes been difficult for the respective states because of the uniqueness of their coastal areas and the multiplicity of uses. Among other things, the management program must provide for adequate consideration of the national interests involved in the siting of facilities necessary to meet requirements which are other than local in nature. On final approval of the program, the state then becomes eligible for grants under Section 306 of the Act which authorizes grants of not more than 80% of the program's administrative costs. Section 307 of the Act deals with interagency coordination and cooperation. Local governments must consider state and regional interests in exercising their regulatory powers in the coastal zone, and federal actions within or directly impacting the coastal zone must be consistent with a state's program once that program has been approved by the Secretary of Commerce. However, should the state determine that a project is inconsistent with its program, it may request mediation efforts by the Secretary. If it is determined that the proposed federal action is consistent with the purpose of CZMA or necessary in the interest of national security, the state's objection may be overruled. A final rule amending existing regulations was published in 44 FR 37142, June 15, 1979, and concerns consistency for DOI OCS prelease activities and other federal activities directly affecting the coastal zone.

Of the five states affected by these sales, Alabama, Mississippi, and Louisiana have approved CZM plans. Louisiana's and Mississippi's plans were approved September 29, 1980, after publication of the DEIS. It is anticipated that Florida's plan will be approved in August 1981. The state of Texas has not pursued further approval of its plan at this time.

3. Estuarine and Marine Sanctuary Programs

NOAA is responsible for the National Estuarine Sanctuary and the National Marine Sanctuary Programs. Sanctuaries provide special protection to designated unique habitats or resources in the marine environment.

CZMA authorized the creation of estuarine sanctuaries. This program is administered by the Office of Coastal Zone Management (OCZM) in NOAA. Any area designated as a National Estuarine Sanctuary is administered at the federal level and may include cooperative management with state agencies.

Under the Marine Protection, Research, and Sanctuaries Act, OCZM is responsible for administering the Marine Sanctuaries Program. Areas designated in this system are managed at the federal level. Although no areas within the planning region of this proposal have been designated to date, several nominated areas are currently being evaluated. A DEIS has been issued by the Department of Commerce on a proposal to designate the area of East and West Flower Garden Banks as a marine sanctuary (U.S. Dept. of Commerce, Office of Coastal Zone Management, 1979). The DEIS presents the rationale for designating this proposed marine sanctuary on the OCS offshore Texas and Louisiana. To protect the distinctive values of the Flower Garden Banks, the following activities would be regulated by the Secretary of Commerce within 4 nmi of the 100 m isobath, an area of approximately 225 square miles:

a. removing, breaking, or otherwise deliberately harming coral bottom formations or marine invertebrates or plants, or taking tropical fish, except incidentally to other fishing operations;
b. operations of vessels other than fishing vessels, including anchoring and navigation, and anchoring by fishing vessels;
c. dredging or altering the sea bed in any manner;
d. construction;
e. discharging or depositing any substance or object;
f. using poisons, electric charges, spearguns, or explosives; and
g. trawling or dragging bottom gear within the 100 m isobath.

The DEIS on the proposal was made available on April 12, 1979; proposed regulations that would apply if the area were designated were published in the *Federal Register* (44 FR 22081-22088) on April 13, 1979. The proposal would apply more restrictions to a larger area than are currently applied by DOI regulations and lease stipulations. Public hearings have been held on the designation of the marine sanctuary and regulations promulgated to protect the sanctuary; formal consultations with the Secretaries of State, Defense, Interior, and Transportation; the Administrator of the Environmental Protection Agency; and other interested federal agencies are in progress. It is not known when, or if, the FEIS for a Flower Garden Banks Marine Sanctuary will be published or if the sanctuary will ever become a reality. Two tracts in proposed Sale 67 are in the area of the proposed sanctuary: 67-224 and 67-225 (High Island Area, East Addition, South Extension, Blocks A-374 and A-385). The appropriate protective stipulations will be applied to these tracts should they be leased (Section I.C.2.b.). The sale of these tracts might conflict with intended NOAA management of the proposed marine sanctuary, but the stipulations will serve to protect the living resources of these banks from damage from oil and gas activities. Two marine sanctuaries have been established in the Florida Keys. Looe Key National Marine Sanctuary was established in January 1981 by 15 CFR 937, and Key Largo National Marine Sanctuary was established in December 1975 by 15 CFR 929. Both of these sanctuaries are far enough away from the proposed lease areas so that no impact from this proposal is expected.

4. Intergovernmental Planning Program

The Intergovernmental Planning Program (IPP) for OCS oil and gas leasing, transportation, and related facilities is a formal coordination and planning mechanism for three OCS program elements: the pre-leasing process, the Environmental Studies program, and transportation planning for OCS oil and gas. This program will apply specifically to those activities which fall within the purview of BLM and does not affect existing authorities and responsibilities.

The IPP is carried out by one element of the national OCS Advisory Board—the Regional Technical Working Group (RTWG) committees. The RTWG is composed of federal and state representatives and people with special interests in the OCS. The other two elements of the board are the Policy Committee and the Scientific Committee. The Policy Committee advises the Secretary of the Interior relative to discretionary functions, including all aspects of OCS exploration and development. The function of the Scientific Committee is to advise the Secretary on the feasibility, appropriateness, and scientific value of BLM's Environmental Studies Programs.

Specific preleasing activities carried out by each RTWG includes review and comment on each Call for Nominations, the draft and final EIS's, proposed and final Notices of Sale, and active participation in the tentative tract selection process for each OCS sale.

5. Land and Water Conservation Fund

Revenues derived by the U.S. government from offshore mineral development have had a tremendous impact on the annual appropriations into the Land and Water Conservation Fund (L&WCF). The L&WCF is the major federally financed grants program instituted by Congress to assist the states in developing and acquiring outdoor recreation lands and facilities and has assisted states in financing comprehensive outdoor recreation planning. Likewise, the L&WCF has been instrumental in assisting federal land managing agencies in purchasing recreation and endangered species lands in national parks, forests, wildlife refuges, wild and scenic rivers, and wilderness areas throughout the country. Over $3 billion, earmarked for public recreation, has been dispersed through the former Heritage Conservation and Recreation Service (HCRS), and Bureau of Outdoor Recreation as matching grants to states and their political subdivisions and as land acquisition funds to federal land managing agencies since the Fund's inception in 1965. Over 65% of these revenues were derived from bonuses, leases, and royalties stemming from exploration and production of oil and natural gas on the federally administered OCS. A 1976 amendment to the L&WCF Act has increased the annual L&WCF authorization ceiling from $300 million to $900 million, thereby, indicating a continued relationship between offshore oil and gas development and enhancement of America's recreation estate.

6. Marine Fisheries Management

The Fishery Conservation and Management Act (FCMA) of 1976 (16 U.S.C. 1801-1882) established a fisheries conservation zone off the coasts of the U.S. and its possessions effective March 1, 1977. The Act establishes the zone from the seaward boundary extending to a line that is 200 nmi from the baseline from which the territorial sea is measured. Policies and standards promulgated by the Act apply specifically to commercial and recreational fishing and the control of fish resources.

The Act created eight Regional Fisheries Management Councils composed of fishermen, state representatives, and officials of federal agencies with responsibilities affecting commercial and recreational fisheries in the marine environment. This Act mandates a continuing planning program to be initiated by the Councils. A Fishery Management Plan based upon the best available scientific and economic data must be prepared for each species (or related group of species) of fish harvested within each respective region. Public hearings are held during the development of each plan, and approval by the Secretary of Commerce is required prior to the issuance of regulations to implement the plans. These plans generally regulate the level and method of catch by domestic and foreign fishermen and may close areas to fishing. Closures concern only fishing activities and not other uses of the OCS such as shipping of oil and gas. Given staff and funding limitations and regional and national priorities, some low-priority but significant species may not have their plans completed for 5-10 years or longer.

The Gulf of Mexico Fishery Management Council will develop the fisheries plans for the Fishery Conservation Zone (FCZ) in the Gulf of Mexico.

As of May 1981, two FMP's for the Gulf of Mexico have been implemented: the stone crab and shrimp plans. Additional plans under consideration and scheduled for completion in 1981 are reef fish (snapper-grouper), coastal pelagics (mackerel), spiny lobster, shrimp, and perhaps billfish. Except for spiny lobster, the aforementioned resources are abundant in the proposed sale areas. A discussion of commercial fisheries is in Section III.C.5. The shrimp plan contains a very controversial seasonal closure on the FCZ off Texas. That closure began on May 22, 1981, and will last until July 15, 1981. This provision is likely to be tested in court.

7. Post-sale Activity Coordination

a. Exploration Activities

USGS is responsible for managing and monitoring the oil and gas operations on the OCS tracts after the leases are issued. An exploration plan must be prepared and submitted for approval to USGS before a lessee may begin exploratory drilling on the lease(s). Except for specific situations offshore Texas, an environmental report is also included with the plan. BLM reviews and makes recommendations to USGS on all exploration plans; FWS does so on selected plans. These documents provide information on the methods to be used in exploration and provide assurances of effective and environmentally sound exploration activities. In accordance with the CZMA of 1972, as amended, exploration plans must contain a certification of consistency with approved state Coastal Management Programs affected by the exploration activities. Permits necessary to perform exploration activities may be described in detail in such plans and avoid state review at a later stage of the process. States with approved programs may take up to six months for consistency reviews but must agree with, or object to, the certification at the earliest practicable time.

An environmental assessment (EA) or a categorical exclusion review (CER) is prepared by USGS based on all available environmental information including the exploration plan, environmental report, and state comments (including consistency certification concurrence where applicable). As part of the technical review of the exploration plan, USGS makes an independent evaluation of geophysical data for geohazards. If the EA indicates that approval of the plan would constitute a major federal action significantly affecting the human environment, an EIS (draft and final) must be prepared. On the basis of the EA or EIS findings, state consistency concurrence, and the technical review by USGS, the exploration plan will be approved, disapproved, or modified.

After approval of the exploration plan and environmental report, the lessee may file an application for permit to drill (APD). The APD is approved by USGS after a detailed review of the application and a hazard analysis of the drill site but not until the state's consistency concurrence is received for the exploration plan. Other permits required prior to exploratory drilling include permits for aids to navigation from the U.S. Coast Guard, navigation permits from the U.S. Army Corps of Engineers, and National Pollutant Discharge Elimination System (NPDES) permits from EPA.

b. Development and Production Activities

Prior to development and production, the lessee must prepare and submit to USGS a development and production plan and, in most instances, an accompanying environmental report. The plan is reviewed by BLM; FWS reviews plans on a selected basis. It describes all development and production activities planned by the lessee for a specific lease(s), the timing of these activities, and may also include applications for platforms, pipelines, and/or production equipment information. The environmental report analyzes both offshore and onshore impacts that may occur as a result of implementation of the plan. The development and production plan and the environmental report are sent to all of the potentially affected states for comments, and to states with an approved CZM plan for consistency certification review. Permits detailed in these plans will not have to be reviewed at a later date by the state's Coastal Management Program Office.

After receiving the development and production plan and the environmental report, USGS prepares either a CER or an EA. If the assessment indicates that approval of the plan is a major federal action significantly affecting the quality of human environment, a DEIS is prepared, followed by a public hearing and a FEIS, prior to the plan's approval (or disapproval).

If the development and production plan is approved, industry submits an APD to USGS. Additional applications submitted for approval to various federal agencies include those to the U.S. Army Corps of Engineers for navigation and platform installation permits, the U.S. Coast Guard for aids to navigation permits, and EPA for NPDES permits. These permits and the APD must be reviewed and approved by the affected states relative to consistency with their Coastal Management Programs, either as described in detail in the plan or separately, before federal agencies may approve them.

With the approval of USGS, the individual lessees determine the amount and duration of production. However, once production begins, certain federal regulatory requirements must be met, including monthly reports of production, lessee compliance with all safety and operating requirements of USGS and the Coast Guard, and obtaining USGS approval of any significant modification of production equipment or procedures.

For various reasons lease termination proceedings may be initiated by DOI or the lessee. In this case, or when a lease expires, all wellheads (for exploration, development, and production) must be cut off below the surface of the ocean floor and other bottom obstructions must be removed. BLM is responsible for all official record title actions.

c. Pipelines

Once oil or gas is found, a grant of right-of-way (BLM) or permission to construct (USGS) may be required for pipeline transportation across the OCS. These applications are reviewed by a number of agencies depending on the purpose of the pipeline, the mineral resource being transported, and the onshore facilities required. FWS reviews all pipeline applications, BLM prepares an EA on their applications, and USGS prepares either an EA or a CER on theirs. In addition, USGS performs a technical review and makes a hazard analysis of the proposed pipeline route. The Department of Transportation's Materials Transportation Bureau is responsible for issuing regulations for pipelines. FERC reviews applications for interstate natural gas pipelines across the OCS, and the U.S. Army Corps of Engineers issues permits for pipeline construction in navigable waters. State and local agencies are responsible for the regulation of pipelines in state waters and review all federal permit applications and other actions relative to pipeline consistency with their approved Coastal Management Programs before federal agencies may issue such permits or take actions.

F. Environmental Studies

BLM's environmental studies program began under the authorization of various legislative requirements; the first of these was the OCS Lands Act of 1953. This was reinforced by the National Environmental Policy Act of 1969 and OCS Lands Act Amendments of 1978. In addition to these acts, support for studies has come from reports by CEQ, the Stratton Commission Report, and the National Academy of Sciences. These acts have been implemented by Congressional appropriations which have identified BLM's environmental studies program as a budget line item since 1975.

The studies program was initiated in 1974 with the following broad objectives: (1) acquisition of information about the OCS environment that will enable DOI and BLM to make better management decisions regarding the development of mineral resources on the OCS; (2) acquisition of information about the OCS environment which will enable DOI and BLM to assess the impacts of OCS oil and gas exploration and development on the marine environment and information which will enable the detection of environmental changes which may occur as a result of oil and gas operations; (3) establishment of a basis for prediction of impact of OCS oil and gas activities in frontier areas; (4) identification of sensitive habitats, potential geological hazards, and other factors of concern on the marine environment; and (5) acquisition of impact data that may result in the modification of guidelines, leasing stipulations, OCS Operating Orders, and Notices to Lessees permitting efficient resource recovery while also insuring protection of the marine environment.

Environmental studies are designed to intimately interact in decisionmaking processes for proposed OCS oil and gas lease sales. Final study products and delivery times are keyed to provide valuable information for the following decision points: calls for nominations, tract selection documentation, EIS's, and SID's. In addition to prelease decisions, environmental studies information is routinely used in such post-lease decisions as exploratory drilling plans, development plans, and pipeline right-of-way applications.

The first environmental studies contracts to be administered by the New Orleans OCS Office centered around the South Texas OCS (STOCS) baseline studies in the western Gulf of Mexico and the Mississippi, Alabama, Florida (MAFLA) baseline studies in the eastern Gulf.

Western Gulf of Mexico

The South Texas OCS baseline studies consisted of three years of field effort and one year of synthesis and integration. The four studies contracts ran from 1975-1980. These studies surveyed hydrography, water mass structure, plankton populations, trace metals, hydrocarbons, micronutrients, dissolved oxygen, salinity, benthic communities, and sediment texture on the South Texas OCS. Seasonal and monthly sampling provided a synoptic picture of the study area for baseline comparison and future monitoring studies.

Coordinated with this effort in the western Gulf were geological studies, fisheries studies, and surveys of topographic features on the Texas and Louisiana OCS. Geological studies in the western Gulf have continued for five years. These studies, carried out by USGS, have gathered baseline data on suspended mineralogy, macrobenthos, sediment texture, sediments, trace metals, and other physical characteristics of the sediment. Much of this information has been synthesized and presented in an environmental atlas series of the Gulf of Mexico. More recently, the Environmental Atlas compilation has been extended into the Pleistocene trend area of the central Gulf of Mexico.

Recent geological studies have also included a study of sediment stability in the region of the Mississippi Delta. Investigations into sediments of the deltaic environment have concerned biogenic methane, mass movements (velocity and frequency), and the role of storm waves in triggering mass sediment movement.

Fisheries studies were also carried out in the western Gulf of Mexico through NMFS. These studies concentrated on reef fish and their migration patterns, larval distribution of commercial species, and an analysis of existing zooplankton samples for diversity and distribution.

A more recent study being conducted through NMFS will survey fishing activities around production platforms in the Gulf of Mexico to assess their importance to recreational fishermen.

In the central Gulf of Mexico, a study of reef fish populations is now entering its second year. The objectives of this survey are to assess fish populations at platforms, reefs, and platforms near reefs in order to gather information on the effects of platforms on their distributions.

Surveys of topographic features have continued for five years now. In the first year, 12 submarine banks in the south Texas area were mapped. This continued into the second and third year with the mapping of 12 more banks in the south Texas area and farther east onto the Louisiana OCS. In addition, biological and geological characterizations of the banks have been carried out utilizing SCUBA equipment and submersibles. Specialized studies of biological diversity, current movement, and suspended sediment distribution around the banks have been included. More recently, monitoring of the East and West Flower Garden Banks has continued on a yearly basis in response to CEQ guidelines for the monitoring of lease stipulations.

The Central Gulf of Mexico Platform Study was initiated in 1978 as a study of the long-term fate and effects of pollutants associated with or derived from offshore exploration and production platforms. Various chemical distributions and biological communities in the immediate vicinity of platforms were compared to those at control sites with emphasis on selected indicators.

In 1978 a series of ecological characterizations was begun through FWS. Two such studies have included the Mississippi Deltaic Plain and Texas Barrier Islands Ecological Characterizations. These studies are conducted in state waters for the development of a data base in making decisions concerning the onshore impacts from offshore oil and gas development. The characterization concept consists of a literature synthesis, habitat mapping, and compilation of socioeconomic information for the development of an ecological atlas and narrative report.

Additional studies to assess the impacts of the Ixtoc oil spill in the south Texas area have been initiated in FY 80. One of these studies will address effects of the oil on such socioeconomic aspects as commercial fisheries, recreation, and tourism. Another study will investigate the extent and nature of oil from the Ixtoc blowout impinging on the south Texas OCS study area and its effects on benthic population and diversity.

In FY 80, a physical oceanography program was initiated in the Gulf of Mexico. Meteorological and physical oceanographic field measurements will be taken in support of biological, chemical, geological, and engineering hazards studies. Also, a shelf circulation modeling study was initiated. The model is both diagnostic and prognostic and will aid in the design of future field studies.

Eastern Gulf of Mexico

In 1974 the first environmental studies in the eastern Gulf were initiated with the Mississippi, Alabama, Florida (MAFLA) OCS Baseline Study. Three years of baseline and monitoring information was gathered. This study was designed, as with the south Texas studies, for the gathering of multidisciplinary synoptic data for the purpose of describing biological, chemical, and geological processes on the MAFLA OCS. Other studies, such as the "Multivariate Analysis of the MAFLA Water Column Baseline Data" (Maturo et al., 1975) and "An extension of the baseline compositions of hydrocarbons in the benthic epifauna . . ." (Meyers, 1976), generated ancillary information on physical oceanography and hydrocarbon chemistry in the MAFLA study area.

A special study entitled "Compilation and Summation of Historical and Existing Physical Oceanographic Data for the Eastern Gulf of Mexico, 1975" summarized available data of the Gulf of Mexico Loop Current, West Florida shelf currents, meteorological factors affecting the oceanographic conditions, river runoff effects in the MAFLA area, remote sensing data, and the results of several drift bottle releases in the Gulf of Mexico.

Other special studies include "Eastern Gulf of Mexico Marine Habitat Study" (Woodward-Clyde Consultants, 1979). This study was conducted to identify areas of hard bottoms conducive to the accumulation of critical biota for Sale 65. Geophysical and bathymetric surveys included precision depth sounding, dual side-scan sonar, high resolution subbottom profiling, and high-resolution seismic subbottom profiling. Groundtruth surveys were carried out with towed underwater closed circuit television systems, underwater 35 mm still cameras, and depth sounders.

In 1977 a special study of ichthyoplankton abundance and diversity in the eastern Gulf of Mexico was implemented. Objectives of this survey were to determine the kinds and abundances of larval fishes, their distribution and diversity, and the relationship of their occurrence to environmental factors.

A special study of polychaetous annelids has recently been initiated for the standardization of taxonomic identifications collected during BLM baseline studies in the Gulf of Mexico. Specific goals of this study are the preparation of a dichotomous key to Gulf of Mexico polychaetes and an illustrated description of all species.

Two ecological characterizations have been initiated in cooperation with FWS. The northwest Gulf of Mexico characterization will synthesize and integrate information of socioeconomic development and habitat alteration in Alabama and northern Florida. A similar characterization will be carried out on the western coast of southern Florida from Tarpon Springs to the Dry Tortugas.

FWS will also continue its endangered species study in the Gulf of Mexico and South Atlantic. This ongoing study is designed to identify distribution and relative abundance of selected endangered species, especially for the purpose of assessing possible effects of OCS oil/gas operations. This study is presently utilizing aerial methods to survey Naples and Merritt Island, Florida, in the eastern Gulf. The study will determine distributions and migrations of these animals through OCS areas, investigate temporal and spatial patterns, identify areas of biological significance, amplify understanding of lesser known species, and formulate specific questions for future investigations. The effort will continue for several years with an initial technical report scheduled for submission in January 1982.

The most recent environmental study initiated in the eastern Gulf is the "Southwest Florida Shelf Ecosystem Study." The study area is on the southwest Florida shelf in the area between latitudes 24°50′N to 27°00′N and in depths between 20-200 m. Mapping, benthic sampling, and water column sampling will be included in the first year effort. In studying both hard/live bottom and sand/mud bottoms, an estimate of the sensitivity and importance of each to the shelf ecosystem will be generated.

Section II

Alternatives Including The Proposed Action

II

II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

The major alternatives to holding these oil and gas lease sales as proposed are: Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas), Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters), Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts), Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks), Alternative C (Delay the Sales), Alternative D (Withdraw the Sales - No Action), and Alternative E (Reoffering of Tracts from Sales A66 and 66). These alternatives, excluding Alternative E, will be compared to Alternative A (Hold the Sales as Proposed). Tracts for Alternative E are unknown at the present time. See Maps A through D for Deletion Modification Alternative Tracts.

A. Alternative A (Hold the Sales as Proposed)

1. Description of Alternative A

The area under consideration for these proposed Gulf of Mexico OCS sales is described in Section I.C.1.

Holding the sales as proposed could result in the potential production of 50.56 million barrels of oil and 912.57 billion cubic feet of gas (mean resource estimates) from 225 tracts for Sale 67 and 26.63 million barrels of oil and 614.06 billion cubic feet of gas (mean resource estimates) from 247 tracts for Sale 69.

Sections IV.A. and B. describe the resource and offshore infrastructure estimates and the development assumptions and scenarios for the proposal.

2. Summary of Environmental Consequences for Alternative A

a. Impact on Biologically Sensitive Areas

Potential impacts to biologically sensitive areas include smothering of benthic organisms and reduced photosynthesis due to the discharge of drilling muds and cuttings; mortality and sublethal effects due to toxic constituents of the drilling muds; and direct mechanical damage to benthic organisms due to anchors and the emplacement of rigs, platforms, and pipelines (Section IV.D.1.a.). The biological stipulations to be imposed are specific to the various banks or live bottoms and will require shunting and/or monitoring as appropriate. Any impact which may occur near the platforms will be in a very small area and only for a short period of time.

(1) Conclusion for Alternative A (Biological)

Because the biological stipulation which will be attached to each lease on or near biologically sensitive areas will be effective in protecting live bottoms and biologically sensitive areas, such areas are not expected to incur reduced productivity.

(2) Cumulative Impact for Alternative A (Biological)

No detrimental impact to live bottom and biologically sensitive areas has been documented from past activities, and since no significant impact is expected to result from this proposal, the cumulative impact to such areas will also be insignificant. Additionally, BLM-funded monitoring studies are continuing at the East and West Flower Gardens; these studies have been carried out over the past six years and to date no impacts have been detected due to the nearby oil and gas operations. Furthermore, over [illegible] years of industry-funded monitoring of a production platform drilling off south Texas has failed to show any detriment on the biota due to that drilling on the nearby bank.

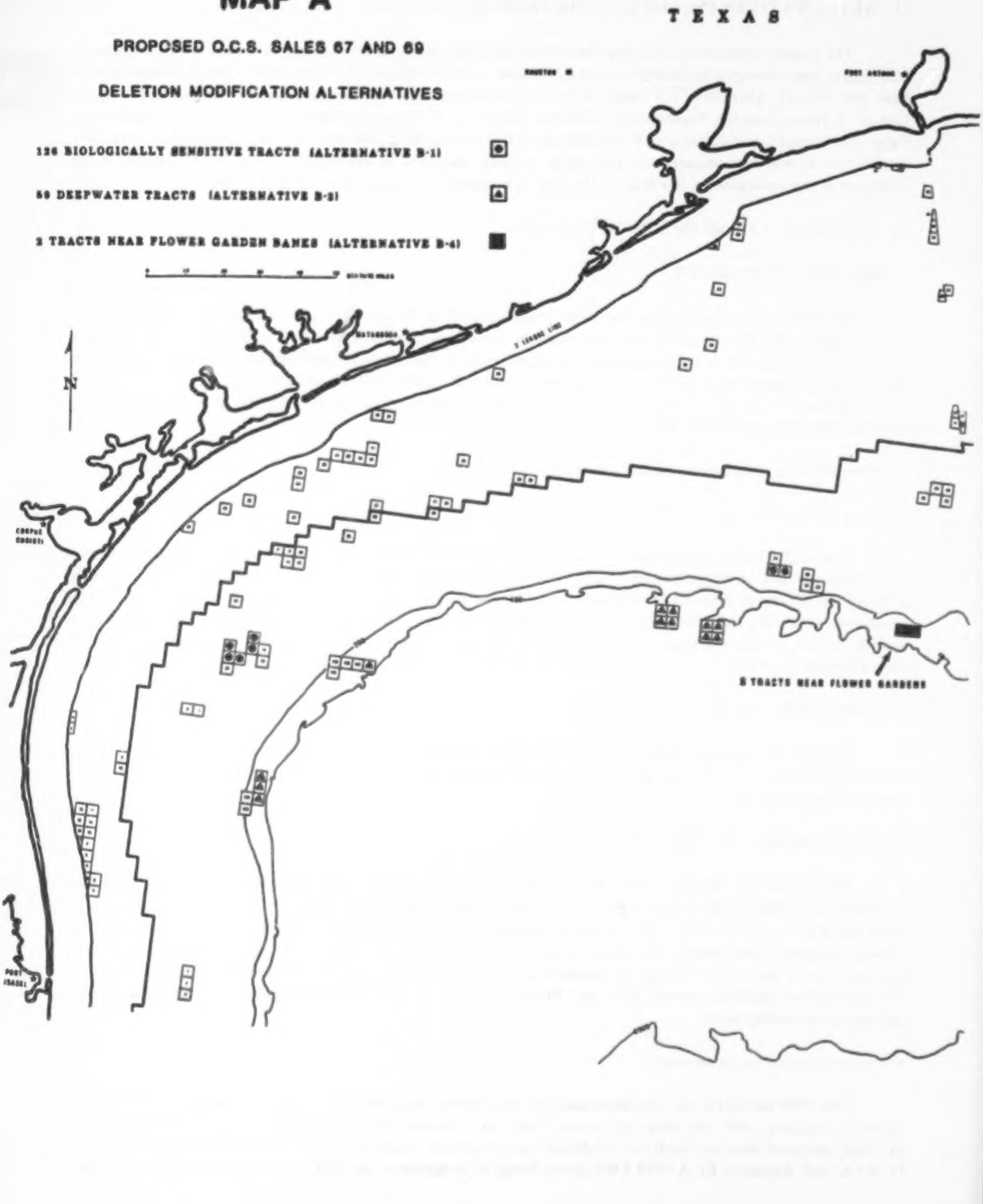
b. Impact on the Florida Manatee

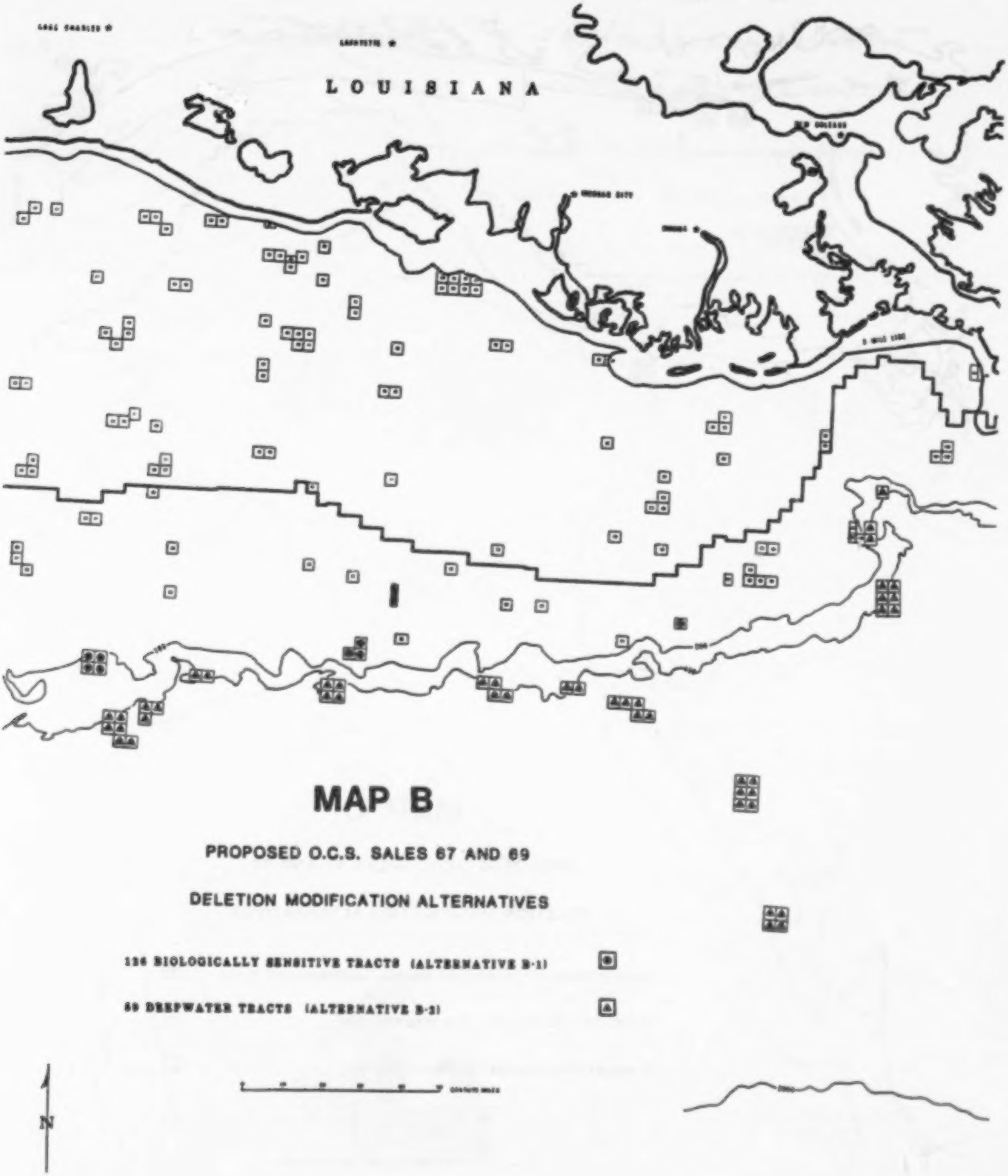
The FWS biological opinion applicable to this proposal indicates that oil and gas leasing and exploration activities resulting from this proposal are not likely to jeopardize the endangered species inhabiting the area of these proposed sales or result in the destruction or adverse modification of their critical habitats (Section IV.D.1.b. and Appendix E). A 1979 FWS survey found 50 manatees in the Alafia River area about 20 miles north

MAP A

PROPOSED O.C.S. SALES 67 AND 69

DELETION MODIFICATION ALTERNATIVES


TEXAS
HOUSTON
PORT ARTHUR
126 BIOLOGICALLY SENSITIVE TRACTS (ALTERNATIVE B-1) ◘
59 DEEPWATER TRACTS (ALTERNATIVE B-2) △
3 TRACTS NEAR FLOWER GARDEN BANKS (ALTERNATIVE B-4) ■
STATUTE MILES
N
MATAGORDA
3 LEAGUE LINE
CORPUS CHRISTI
PORT ISABEL
100
3 TRACTS NEAR FLOWER GARDENS


LAKE CHARLES
LAFAYETTE
LOUISIANA
NEW ORLEANS
MORGAN CITY
HOUMA
3 MILE LINE
N

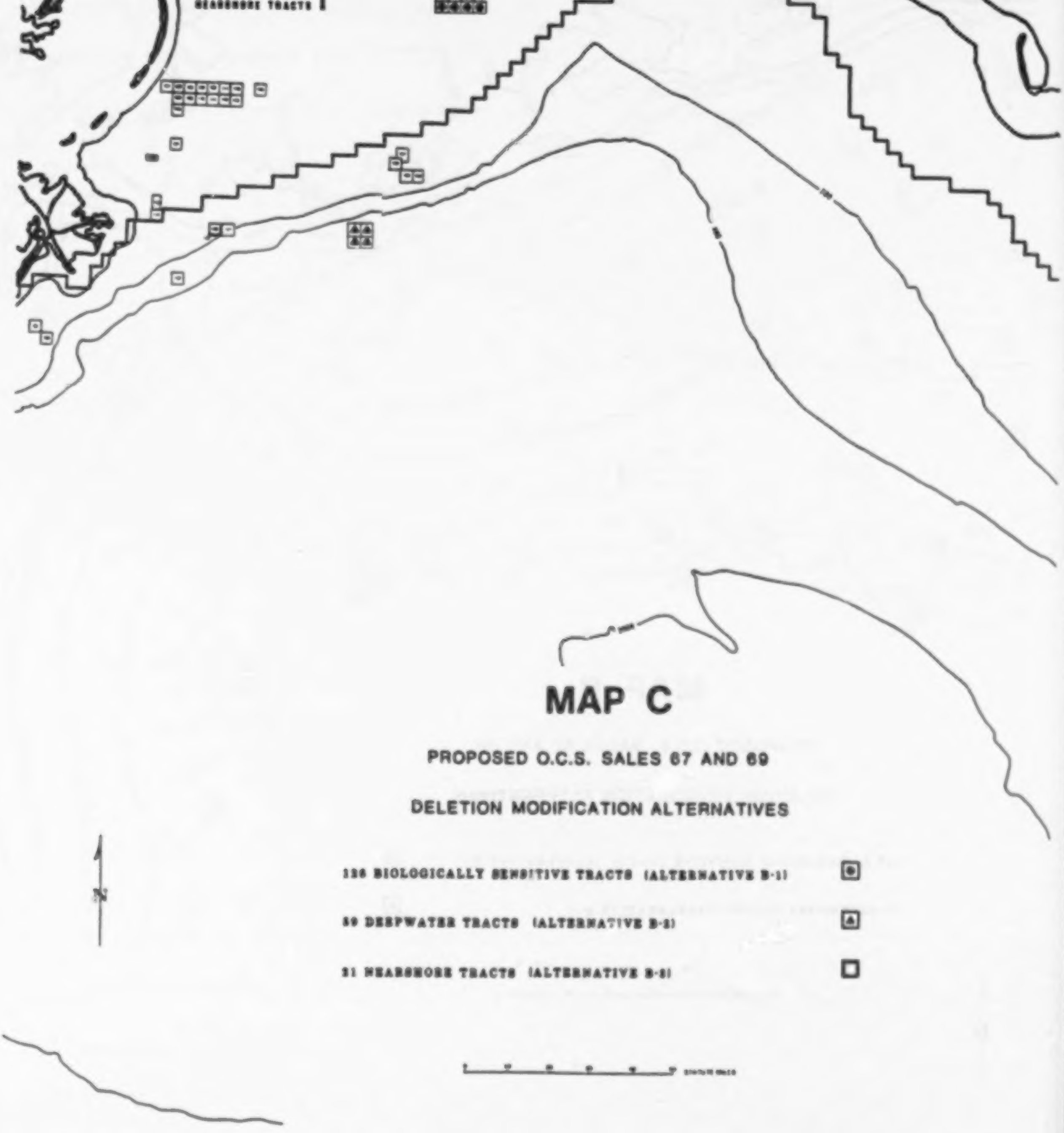
MAP B

PROPOSED O.C.S. SALES 67 AND 69

DELETION MODIFICATION ALTERNATIVES

126 BIOLOGICALLY SENSITIVE TRACTS (ALTERNATIVE B-1) ▣

59 DEEPWATER TRACTS (ALTERNATIVE B-2) ▲


GULFPORT
M S.
A L.
PENSACOLA
FORT WALTON
F L.
PANAMA CITY
NEARSHORE TRACTS
N

MAP C

PROPOSED O.C.S. SALES 67 AND 69

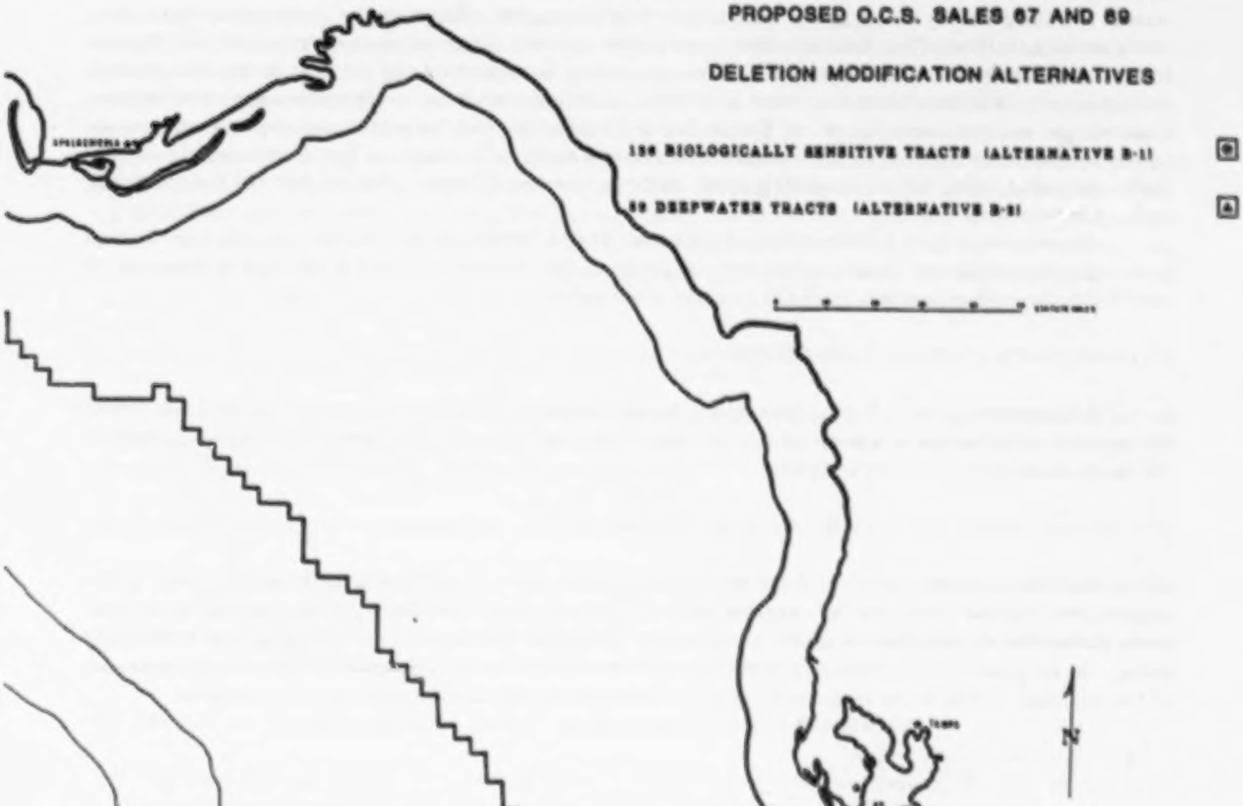
DELETION MODIFICATION ALTERNATIVES

126 BIOLOGICALLY SENSITIVE TRACTS (ALTERNATIVE B-1)	⊡
59 DEEPWATER TRACTS (ALTERNATIVE B-2)	⧋
21 NEARSHORE TRACTS (ALTERNATIVE B-3)	☐

MAP D

PROPOSED O.C.S. SALES 67 AND 69

DELETION MODIFICATION ALTERNATIVES


136 BIOLOGICALLY SENSITIVE TRACTS (ALTERNATIVE D-1)
59 DEEPWATER TRACTS (ALTERNATIVE D-2)
STATUTE MILES
APALACHICOLA
TAMPA
ST. PETERSBURG
SARASOTA
FORT MYERS
N
FLORIDA

of Port Manatee, Florida. This represents about 5% of the 750-900 manatees estimated to inhabit Florida coastal waters. If drilling activity occurs in the eastern Gulf of Mexico region, offshore service vessels would make about 3-7 trips/week to/from Port Manatee. This vessel traffic uses the southwest deepwater (ca 40 feet) channel to/from Port Manatee and will add about 5% to the existing vessel traffic using the port during the period of drilling activity. Manatees could be injured or killed by collisions with these vessels under some circumstances; however, the major manatee habitat in Tampa Bay is 20 miles north of the port in shallow water, the service vessels are presently required to use channels which have a depth of at least four feet deeper than the vessels' draft, and only a slight increase in existing vessel traffic is expected. Therefore, the possibility of manatee/vessel collision is very unlikely.

Oil spills could have a minor effect on manatees. The probability of one or more oil spills (greater than 1,000 bbls) occurring and contacting manatee habitat along the Florida Gulf coast is less than 0.5% within 30 days during the average production life (13 years) of this proposal.

(1) Conclusion for Alternative A (Florida Manatee)

It is concluded that it is very unlikely for manatee/vessel collisions to occur or that oil spills will impact the manatee or its habitat as a result of this proposal. Therefore, any adverse impacts to manatees as a result of this proposal are expected to be negligible.

(2) Cumulative Impact for Alternative A (Florida Manatee)

No manatee/vessel collisions have been reported as a result of previous offshore service vessel traffic to/from Port Manatee, and none are expected as a result of this proposal because the level of activity is expected to be similar. No oil spills have occurred in this area as a result of previous OCS oil and gas activities that could impact the manatees or their habitat, and a minimal number (0.37) of oil spills are expected to occur as a result of this proposal. Therefore, no cumulative impacts to manatees are expected to result from this proposal.

c. Impact on Recreational Fishing

Impact on recreational fishing is discussed in Section IV.D.1.c. This proposal should enhance recreational fishing potential offshore by creating 17-65 (30 expected) new artificial reefs which will concentrate sport fishing targets in the Gulf of Mexico within leased tracts which are ultimately developed. These platforms will eventually attract sport fishing and SCUBA endeavors, especially in the nearshore tracts most accessible to the offshore Gulf of Mexico boating population. Current operational practices and accidental pollution events associated with production platforms are known to affect the environment with low level contaminants; however, these contaminants are not expected to cause health consequences to recreational endeavors associated with oil and gas structures.

(1) Conclusion for Alternative A (Recreational Fishing)

This proposal will enhance recreational fishing by an expansion of sport fishing opportunities around approximately 30 new platforms.

(2) Cumulative Impact for Alternative A (Recreational Fishing)

These sales are likely to maintain and expand the unique recreational fishery known as "rig fishing" which has become a prime focus of almost all offshore recreational endeavors in the central Gulf of Mexico. Specifically, these sales could add approximately 30 platforms (artificial reefs) to the 3,500 already existing in the Gulf of Mexico. Petroleum development in the offshore marine environment over time has, and will continue to increase the level of recreational activity on the OCS.

d. Impact on Coastal and Marine Birds

The impacts on coastal and marine birds are discussed in Section IV.D.1.d. The coastal and marine birds most vulnerable to oil spills are those which dive into the water to feed and those which roost on the water's surface. The expected number of potential oil spills resulting from the proposal (0.37 spills) and the probability of potential oil spills reaching land (4% within 30 days) is very low; therefore, adverse impacts to coastal and marine birds and their habitats from potential oil spills are expected to be minimal. Any new onshore facilities constructed in the Mobile and/or Tampa Bay areas as a result of this proposal are expected to be located in existing developed areas and would have a minimal adverse impact on coastal birds and their habitats in these areas.

The expected number of potential oil spills from existing leases (14.97 spills) and waterborne transportation (23.23 spills) is much higher than for the proposed leases and could result in a moderate adverse impact to coastal and marine birds and their habitats, especially to brown pelicans in the Louisiana coastal areas.

(1) Conclusion for Alternative A (Coastal and Marine Birds)

Potential oil spills and facility construction resulting from this proposal will have a minimal adverse impact on coastal and marine birds and their habitats. A minimal amount of bird losses will occur as a result of oiling of feathers, nest disturbance, and loss of nesting habitats.

(2) Cumulative Impact for Alternative A (Coastal and Marine Birds)

The cumulative impact of existing oil and gas production facilities and this proposal would be a minimal increase in potential adverse impacts to coastal and marine birds and their habitats in the Gulf of Mexico region. A minimal increase in chronic oil spills throughout the Gulf of Mexico region could produce incremental losses of coastal and marine birds from oiled plumage and reduce egg hatchability.

B. Alternatives B-1 through B-4 (Modify the Proposal Via Tract Deletions)

If these deletion options are exercised by the Secretary of the Interior, there would automatically be a lessening of any cumulative impacts which might have occurred if the sales were held as proposed.

1. Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas)

a. Description of Alternative B-1

This alternative would delete all the 126 tracts near biologically sensitive areas, including the 107 tracts on the Florida shelf which may be on or near live bottom areas. This deletion option would remove about 37.2% and 17.4% of the tracts under consideration for Sales 67 and 69, respectively. It also represents 33.6% of the oil and 18.3% of the gas estimates (mean) for Sale 67, and 27.9% of the oil and 6.0% of the gas estimates (mean) for Sale 69. See Table IV-4 for further estimates of the effects of this option.

Eighty-three tracts in proposed Sale 67 and 43 tracts in proposed Sale 69 would be deleted. Section III.B. discusses these areas, and Section I.C.2.b. describes and discusses the stipulations that will be appended to the lease on each of these tracts leased as a result of this proposal. DOI believes that these tracts can be offered to and explored and developed by the oil and gas industry with no harm resulting to the biota of these areas provided that the stipulations cited in Section I.C.2.b. are imposed.

b. Summary of Environmental Consequences for Alternative B-1

The consequences of deleting these 126 tracts would be to remove any potential damage from oil and gas operations, such as smothering of benthic organisms, reduced photosynthesis, lethal and sublethal toxic effects, and direct mechanical damage to the biota of eight topographic features in the central and western Gulf of Mexico as well as to the biota of any live bottom areas that might be associated with the 107 tracts on the Florida shelf. With no activity in the area, there would be no danger of harming the biota of the banks by activities resulting from this proposal—anchors, rig and platform emplacements, muds and cuttings discharges, and pipelines. Alternative B-1 would remove the potential impact of vessel/ manatee collisions and oil spills from manatee habitat that could result from leasing the 73 tracts within the Charlotte Harbor Area and 4 tracts within the St. Petersburg Area which probably would be serviced from Port Manateee, Florida. Furthermore, even if all eight platforms were placed directly over live bottoms, this would only preclude the use of about 40 acres to commercial fishing operations. These platforms would increase hard substrate and most likely increase recreational fishing opportunities around them. If this alternative were adopted there would be a moderate (15%-30%) reduction in potential adverse impacts to coastal and marine birds from potential oil spills and the removal of any adverse impacts to coastal birds from onshore facility construction in the eastern Gulf region resulting from the proposal.

c. Conclusion for Alternative B-1

It is concluded that adoption of Alternative B-1 would remove any potential for damage from oil and gas operations, such as smothering of benthic organisms, reduced photosynthesis, lethal and sublethal toxic effects, and direct mechanical damage to the biota of biologically sensitive areas and remove the potential impact of collisions between offshore service vessels and manatees in the eastern Gulf region which could result from this proposal. This deletion would also negate the potential erection of eight platforms which would eventually become artificial reefs, moderately reduce potential oil spill impacts, and remove potential onshore facility construction impacts to coastal and marine birds and their habitat in the eastern Gulf region resulting from this proposal.

d. Cumulative Impact for Alternative B-1

There are no cumulative impacts for deleted tracts.

2. Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters)

a. Description of Alternative B-2

There are 36 tracts in Sale 67 and 23 tracts in Sale 69 which contain water depths greater than 400 m and which would be deleted under Alternative B-2. They are:

Sale 67	67-128	67-145	67-158	67-167
	67-129	67-146	67-159	67-168
	67-130	67-147	67-160	67-169
	67-131	67-148	67-161	67-170
	67-136	67-149	67-162	67-171
	67-137	67-150	67-163	67-172
	67-141	67-155	67-164	67-173
	67-143	67-156	67-165	67-174
	67-144	67-157	67-166	67-175
Sale 69	69-132	69-139	69-146	69-152
	69-134	69-140	69-147	69-153
	69-135	69-142	69-148	69-154
	69-136	69-143	69-149	69-155
	69-137	69-144	69-150	69-157
	69-138	69-145	69-151	

The water depths of the tracts in Sale 67 are from 400 m to about 1,250 m, and for the Sale 69 tracts the depths vary from 400 m to about 2,400 m.

Estimates for each proposed sale are:

Sale 67 - Deepwater tracts in Sale 67 represent some 16% of the tracts in this sale. The deletion of these tracts might result in the loss of approximately 18.9 million barrels of oil and approximately 207.8 billion cubic feet of gas. As a result of the leasing of these deepwater tracts, it is estimated that some 20 exploratory wells, 20 delineation wells, and approximately 40 development wells might be drilled. It might also result in the installation of some five platforms and two subsea completions some time in the future.

Sale 69 - Deepwater tracts in Sale 69 represent some 9% of the tracts in this sale. The deletion of these tracts might result in the loss of approximately 25.8 million barrels of oil and approximately 595.0 billion cubic feet of gas. As result of the leasing of these deepwater tracts, it is estimated that some 12 exploratory wells, 12 delineation wells, and 80 development wells might be drilled. It might also result in the installation of some eight platforms and two subsea completions some time in the future.

The industry presently has the capability to drill in water depths to about 2,500 m. Research is currently being conducted by several major oil companies, and projections from such research are that within five years technology will permit drilling in water depths to 3,000 m. The deepest exploratory well for oil or gas was drilled in 1,486 m of water off Newfoundland. The deepest commercial wellhead completion is a dry completion in 189 m off Brazil. The deepest wet tree subsea completion is in 146 m in the North Sea. A general consensus in the oil industry, however, is that they can presently produce in up to 900 m of water and that within 10 years they will have the technology to produce in over 1,800 m of water.

The deepest pipeline laid to date was the trans-Mediterranean 20-inch line in 600 m of water. There are plans for a line from Algeria to Spain in some 2,000 m of water.

For a more detailed discussion of industry deepwater technology, see Appendix I of the FEIS for Proposed OCS Oil and Gas Lease Sale 56.

A logical assessment would be that much of the "easy" oil and gas has already been found and, as the demand for hydrocarbon resources continues in the future, the search for such resources must necessarily move to areas that have not previously been explored, such as deepwater.

Deepwater tracts are generally those located greater distances from shore and are, therefore, less accessible to the broad range of recreational fishermen capable of accessing offshore recreation destination areas. Possibly some big game fishermen who travel 35-150 miles offshore seeking their trophies will have less opportunity to fish near new oil and gas artificial reefs if these tracts are deleted.

b. Summary of Environmental Consequences for Alternative B-2

Alternative B-2 would delete 59 deepwater tracts which would remove these tracts from development and reduce any alleged risk, and allow for greater time to develop new deepwater equipment and technology.

These 59 deepwater tracts, located in the central and western Gulf region, are in an area where there are no manatee habitats, and none of these tracts would be serviced from any known manatee habitat areas.

Should this deletion be adopted there would be a minor (5%-10%) reduction in potential adverse impacts to coastal birds and a moderate (15%-30%) reduction in potential adverse impacts to marine birds from potential oil spills in the central Gulf region resulting from this proposal.

c. Conclusion for Alternative B-2

Alternative B-2 would delete 59 deepwater tracts in the central and western Gulf region. This would preclude any oil and gas activities and any impacts to the biota in these tracts resulting from this proposal.

Alternative B-2 will have no effect on manatees or their critical habitat areas because these tracts are located outside manatee habitat areas, and this alternative will have no effect on recreational fishing. This deletion would minimally reduce any adverse impacts of potential oil spills to coastal birds and moderately reduce adverse impacts to marine birds and their habitat, especially offshore Louisiana and Texas. This alternative will have little effect, if any, on big game fishermen.

The oil and gas industry currently has the technology to safely explore for oil and gas in water depths to 2,500 m; and, although production has been limited to water depths of less than 300 m by lack of commercial discoveries, the technology exists to safely produce in water depths up to 900 m. Environmental consequences resulting from deepwater operations would be minimal and would result primarily from a localized increase in water turbidity at the site.

d. Cumulative Impact for Alternative B-2

The deletion of 59 deepwater tracts from these proposed sales would preclude the occurrence of any potential environmental impacts; however, since these tracts represent 13% of the proposed tracts, negative economic impacts could result from their removal from possible exploration and development, and thereby reduce oil and gas revenues, royalties, and associated employment.

3. Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts)

a. Description for Alternative B-3

Through the scoping, environmental review, and coordination processes, special concern has been expressed and documented concerning the potential adverse impacts associated with leasing the 21 nearshore tracts (tracts 67-106 through 67-126) located from 3-9 nmi seaward of the barrier islands of the Mississippi/Alabama shorefront. The three major islands located directly to the north of these 21 tracts represent a diversity of public and private recreational resources. Specific concerns relate to the integrity of the shoreline's natural and recreational resources and to the aesthetic effect on visitor use of the Mississippi/Alabama outer islands from leasing these nearshore tracts, especially the wilderness character of the Gulf Islands National Seashore. Specific discussion and visual depiction of the effected environment is presented in Section III.C.6.b.

The 21 tracts included in this deletion alternative include all or portions of 25 contiguous lease blocks located from 3-9 miles directly south of Petit Bois and Dauphin Islands and the western end of Pleasure Island. Prior to this proposal the closest tracts offered for lease on the OCS in this vicinity were located within 15 miles of Horn, Petit Bois, and Dauphin Islands (OCS Sales 51 and 58) and 18 miles south of Gulf Shores, Alabama (OCS Sale 65). As noted on Visual 1, five of these tracts are now active leases.

b. Summary of Environmental Consequences for Alternative B-3

Leasing any or all of these 21 Mississippi/Alabama nearshore tracts will lead to direct lease site activities and operations which will require onshore support activities and result in marine and air transport of people, supplies, and products. All of these activities and operations will have some predictable impact on the Mississippi/Alabama outer islands and will likely impact some recreational uses of these islands and associated marine waters.

It is estimated that one or possibly two drilling rigs will be operating at any one time during the exploratory phase on these 21 tracts should these sales be held as proposed. Since the water depths in these tracts range from only 10-20 m, submersible or jack-up type drilling rigs are likely to be used for exploratory drilling. The derrick supporting the drilling operations or the legs supporting a jack-up rig can extend up to 300 feet above the water surface. It takes a month or two to drill an exploratory well, and 1-5 exploratory wells may be drilled on a lease. Therefore, a drilling rig may remain on a lease for up to one year. If commercial quantities of oil and/or gas are discovered, production platforms will be designed, ordered, constructed, and installed for further drilling and production activities on a lease site. One or two production platforms are likely to be constructed on a commercially productive lease. Production platforms may remain on location for 10-30 years before production is terminated.

Since all tracts in a lease sale are unlikely to be leased and all leased tracts are unlikely to be commercially productive, especially in an area which has yet to be tested, it is estimated that offering these 21 tracts will result in the drilling of only 20 exploration and delineation wells. This would lead to the construction of 3-5 production platforms. During normal, clear weather conditions, both the drilling rigs and production platforms on the lease sites will be plainly visible from the south beaches and dunes of the islands directly north of the lease tract that is being explored or developed. Therefore, these rigs and structures will cause some long-term (1-30 years) visual impacts likely to affect the character of some recreational uses on portions of Petit Bois, Dauphin, and Pleasure Islands. The visual impact is more significant as it relates to the Mississippi barrier islands because Petit Bois and Horn Islands are part of the Gulf Islands National Seashore and are included in the National Wilderness System. Even though the offshore lease tracts are at least three miles from the designated wilderness shoreline area, the visual quality objective of the National Park Service is to maintain the pristine quality of the viewshed or the natural ocean horizon background for the wilderness visitor.

The nearshore marine environment and proposed lease tracts directly south of the Mississippi/Alabama islands constitute an important viewshed in the background landscape of the shorefront lands of the outer islands. This viewshed would extend approximately 15-18 miles in relation to structures up to 300 feet above the water surface. Oil and gas activity from 3-9 miles offshore is unlikely to dominate the characteristic foreground landscape but would introduce a definite visual impediment to the natural background landscape similar to that depicted in Figure II-1. Figure III-1 in Section III.C.6.b. shows that most of the areal extent of the four lease tracts directly south of Gulf Islands National Seashore Wilderness Area (Petit Bois Island) are within established navigation fairways. Oil and gas structures are not allowed in navigation fairways; therefore, the closest point an oil and gas structure is likely to be constructed is at least six miles from the established wilderness area.

The rigs and platforms necessary for exploration, development, and production are supported by water and air traffic vessels moving supplies and personnel from shore to the lease site operations. Typically, three boats (100-200 foot class) and one helicopter are used in accomplishing vessel transport between the onshore staging/support/supply bases (generally combined into one area) and the offshore lease site.

Of the three boats servicing the offshore lease, the smallest (up to 100 foot) is a crew boat which averages three round trips per week between shore and lease site to exchange labor crews. Also, averaging three round trips per week is a large (180 foot) cargo boat shuttling equipment, supplies, and refuse between shore and lease site. Most leases with active operations also maintain a standby boat (130 foot) on site at all times for offshore shuttling and safety purposes. Additionally, one round trip per day by helicopter can be expected when offshore operations begin. Therefore, each active lease can expect to generate approximately one round trip per day by boat (100-300 foot class) and one by helicopter between shore and lease site. These vessels will be visible for several miles, emit noises, create wakes, and potentially contribute minor pollutants to the marine environment. Although the precise location of onshore staging/support/supply bases are unknown, there are several suitable sites in south Mobile County (Bayou La Batre or the Theodore Industrial Area) and industrial development sites in Mississippi's coastal zone which are capable of accommodating these needs. Transport vessels will likely travel existing commercial water and air traffic lanes which includes the intracoastal waterway north of the outer islands for east-west movement and the Biloxi, Pascagoula, or Mobile north-south ship channels for traveling past the outer islands to the desired offshore lease site locations. These commercial vessel traffic lanes are very near the ends of the wilderness islands (Horn and Petit Bois) included in the Gulf Islands National Seashore and within site of the west end of Pleasure Island (Fort Morgan) and the east end of Dauphin Island. Therefore, some recreational users of the Mississippi/Alabama islands may see, hear, or be affected by debris from the vessel transport requirements associated with the exploration and development of these 21 tracts.

Sections IV.B. and IV.C.3. provide possible development scenarios for transportation of products as a result of the proposal. The 21 Mississippi/Alabama nearshore tracts are included in an area grouping identified as the Upper Gulf Offshore Development Area. Although there are existing oil and gas product transportation pipelines servicing this area, significant new commercial finds, including commercial discoveries in the 21 tracts composing this Alternative B-3 deletion option, could stimulate the development of a new major common carrier pipeline system which would carry oil or gas to some location in the Mississippi/Alabama coastal zone. Should the most prudent and feasible right-of-way for such a pipeline cross one of the Mississippi/Alabama shorefront islands, there would be a temporary removal of some recreational lands during construction. A similar pipeline crossing at Padre Island National Seashore in Texas resulted in the removal of 1,200-1,600 feet of beach for 2-3 weeks.

Probably the most feared impact from oil and gas leasing is the threat of a major oil spill which could affect shorefront recreational resources and activities. Appendix D of the DEIS provides a comprehensive oil spill risk analysis for Sales 67 and 69 relative to existing leases in the Gulf of Mexico. From this analysis we can obtain an estimate of the risk associated with offshore activity, particularly that risk associated with oil spills. Appendix D of the DEIS presents the analysis in such a manner that we may assess the risk in the following ways:

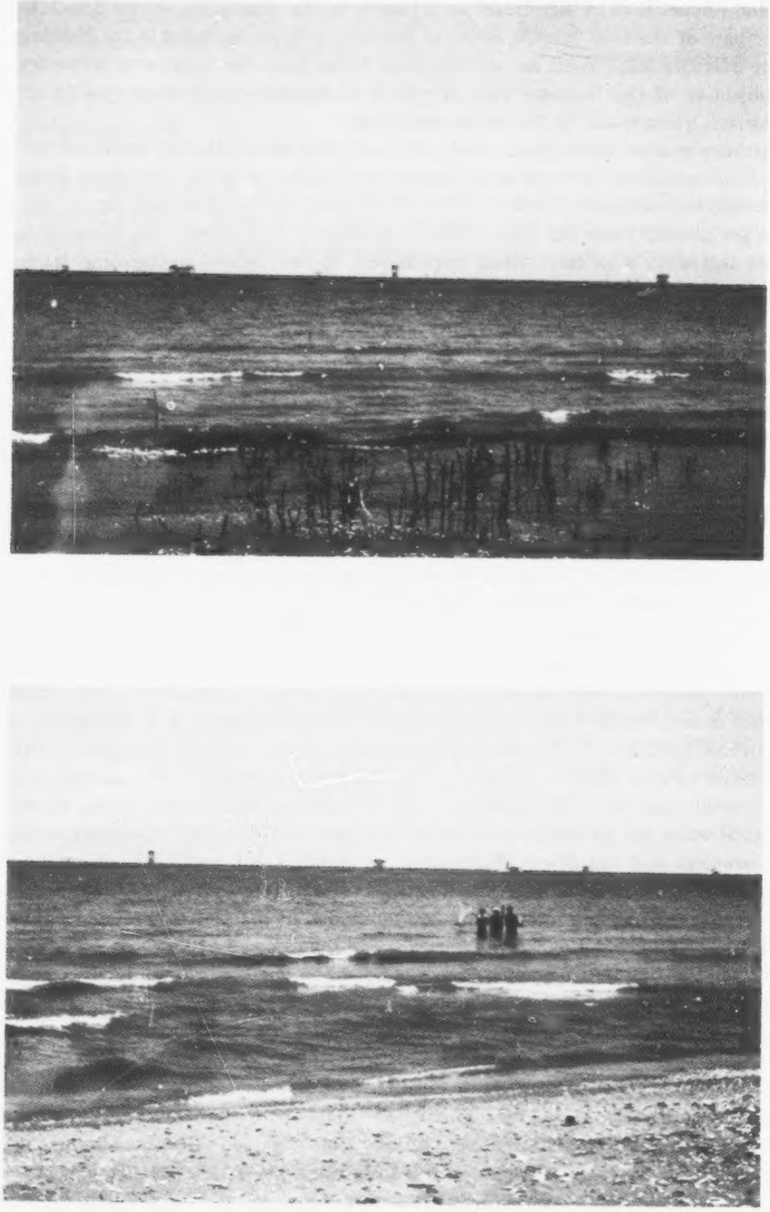


Figure II-1 Oil and Gas structures 3 to 12 miles off the Louisiana coastline. Bottom photo includes people and shrimpboat in the foreground and middleground of shoreline viewshed.

(1) the expected number of spills, the most likely number of spills, and the probability of one or more spills occurring relative to Sales 67 and 69, existing leases, the combination of Sales 67 and 69 and existing leases, and existing transportation (Appendix D of the DEIS, Table 1);

(2) a trajectory analysis showing the probabilities that an oil spill starting at a particular location (Spill Points 1-100) would contact a certain land segment (target) (Appendix D of the DEIS, Tables 2-10); and

(3) the probabilities of one or more spills, the expected number of spills, and the most likely number of spills occurring and contacting targets over the production life of the lease area relative to the leases and the combination of existing and proposed leases (Appendix D of the DEIS, Tables 11-13).

We may also go a step farther and obtain this analysis relative to the 21 Mississippi/Alabama nearshore tracts by referring to the appropriate tables (Appendix D of the DEIS, Tables 2-13) and referencing the proper land segments (Set 1, segments 21 and 22).

The trajectory analysis (Appendix D of the DEIS, Table 5) indicates that if a spill was to occur from the 21 nearshore tracts (Spill Point 97), it would offer a 33% probability of contacting segment 21 and a 13% probability of contacting segment 22 as a result of movement by currents and winds within three days of the spill. The above figures indicate the probabilities of a spill contacting a target, assuming that the spill occurs in a given area (Spill Point 97).

We must also consider two very important factors—first, the likelihood of spill occurrence (dependent upon oil being encountered) and secondly, the cumulative impact of existing and proposed leases. When we consider the probability of spill occurrence, we must consider that Table 1 (Appendix D of the DEIS) gives us a 31% probability of one or more spills occurring in the Gulf of Mexico resulting from Sales 67 and 69 and a 99% probability of occurrence resulting from both existing leases and existing transportation. However, when we examine the same table in relation to the expected number of spills, we see a contrast. Even though the cumulative effects of Sales 67 and 69, existing leases, and existing transportation would result in a probability of spill occurrence of 99%+, we realize that Sales 67 and 69 are expected to result in .37 spills in comparison to 14.97 for existing leases and 23.23 spills for existing transportation.

If we consider the fact that these 21 nearshore tracts are termed as gas prone, we realize the likelihood of encountering gas is quite high as opposed to the likelihood of encountering oil (in recoverable quantities), which is much lower. This does not mean that it will not happen, but only that experiences and new finds indicate the likelihood of gas.

Appendix D of the DEIS, Table 12, indicates that the probability of a spill occurring and contacting land segments 21 and 22 is very low for Sales 67 and 69 and for existing leases. In addition, Table 12 shows the expected number of spills occurring and contacting land segments 21 and 22 is 0 within 30 days and over the production life of the lease area.

From the above analysis we can conclude that the likelihood of spill occurrence from these 21 tracts is quite low. However, if a spill occurs anywhere in these 21 tracts, there is a probability of 33% and 13% that it will impact land segments 21 and 22, respectively. Also, the sale of these tracts offer little additional risk of impact to land segments 21 and 22 over existing conditions.

Even though the 21 nearshore tracts are gas prone, it is not absolutely certain oil will not be encountered. If a commercial oil field were discovered, or if significant quantities of oil are produced with gas (condensate), a major accident and spill from these 21 tracts is not inconceivable. Such an event could lead to a decreased period of use and loss of tourism, plus aesthetic loss for a period of a recreation season. Size, duration, seasonality, type of oil, containment success, and publicity associated with such an unlikely event ($<$ 2% probability) will affect the severity of impact.

It should be noted that sometimes oil is associated with commercial gas production; therefore, oil resulting from accidents associated with these 21 tracts could affect the south beaches of the Mississippi/ Alabama outer islands. The expected result of oil washing onshore is temporary closure of portions of the affected beach areas during containment and cleanup operations. Obvious effects from such incidences would likely be removed within 2-10 days. The level of recreational use is not expected to decline significantly unless extensive publicity results from a major pollution event or the source of a major spill cannot be expeditiously controlled resulting in continuous pollution impact occurrences on the beaches. Extensive publicity about such a spill could impact recreational use for a considerable longer period after cleanup is completed and equipment is removed from the area. The quality of some public use experiences will decline, however, until all traces of the pollution event have disappeared. These residual effects consist mainly of intermittent tar balls and visual traces of containment and cleanup operations which can extend for several months and for many miles.

Alternative B-3 would delete 21 tracts within the Mobile Area. This is an area where manatees seldom occur, and these tracts would not be serviced from any known manatee habitat areas.

Should this deletion be adopted there would be a minor (5%-10%) reduction in adverse impacts to coastal birds and their habitats in the Mississippi/Alabama coastal area resulting from this proposal.

c. Conclusion for Alternative B-3

Petroleum structures (3-5) will be visible from portions of the south shore of the Mississippi/Alabama outer islands for an extended period of time (1-30 years). These structures will introduce an unnatural contrast to the characteristic seaward background viewscape noticeable by some beach and wilderness users of these islands.

Adding to the visual intrusion will be large (100-200 foot class) boats and small helicopters making daily passes by the Mississippi/Alabama outer islands in established traffic lanes. They are likely to be seen and heard by some recreational users of the islands, especially those primarily using the ends of the barrier islands.

The lease site operations and vessel transportation requirements associated with these 21 lease tracts could lead to small pollution incidences and result in incidental and accidental disposal of floatables offshore which will contribute to widely dispersed and intermittent trash, debris, and hydrocarbon residues on the south beaches of the Mississippi/Alabama outer islands. These incidences could temporarily displace some beach use activities but are not expected to affect the overall level of recreational use.

Alternative B-3 will have no effect on manatees or their critical habitat areas because these tracts are located outside of manatee habitat.

Deletion of these 21 tracts nearshore Mississippi/Alabama will remove the potential adverse impacts of oil spills and facility construction from this Upper Gulf area and reduce the potential enhancement of recreational fishing provided by any platforms that may have been constructed.

This deletion alternative would minimally reduce potential oil spill impacts to coastal birds and their habitats in the Mississippi/Alabama coastal area.

d. Cumulative Impact for Alternative B-3

Ongoing and projected oil and gas activity further offshore, in state waters, and in the Mississippi/Alabama coastal zone, as well as local, national, and international commerce (Commercial fishing, port operations) are affecting or predictably will affect the recreational use of the Mississippi/Alabama outer islands similar to the assessed impact associated with including the 21 nearshore tracts in this proposal. Specifically, oil and gas exploration and development are currently in progress further offshore on the OCS and at the mouth of Mobile Bay which is in close association (within 3 miles) of the east end of the Dauphin Island and the west end of Pleasure Island. The state of Alabama has recently leased additional state water bottoms between the south side of its outer islands and the OCS. Although the state of Mississippi has no active leases in its territorial waters, they have expressed no policy contrary to developing petroleum reserved on state water bottoms should these reserves become marketable.

The ports of Pascagoula and Gulfport are serviced by approximately 1,000 ocean-going vessels per year which utilize the Biloxi and Pascagoula ship channels. These same very large vessels awaiting berth and passage to Mississippi and Alabama ports can often be seen anchored from two to six miles south of Petit Bois and Dauphin Islands. Many large offshore commercial fishing boats, mainly diesel-powered shrimp boats, also use these same island passes when traveling to the offshore fishing grounds or returning to port. The Mississippi Sound just inside the outer islands is a popular anchorage area for idle commercial fishing boats.

The Pascagoula Chevron refinery is supported by lightering operations between supertankers (ULCC's and VLCC's) and tankers (800 foot class) approximately 60 miles south of Mobile Bay. This results in approximately two tankers daily passing between Horn and Petit Bois Islands. Chevron has announced a billion-dollar modification of the Pascagoula refinery which should increase its capacity and demand for foreign crude oil. Existing submerged and buried pipelines from south Louisiana traverse through or pass near the Mississippi outer islands.

Sales 67 and 69, along with approximately 2,000 active OCS leases and all the existing and projected movement of oil in the Gulf of Mexico (tankering and pipelines), will almost certainly lead to one major oil spill (99% chance, p. 342 of the DEIS) over the next 30 years that will impact some coastal shorefront in the Gulf of Mexico. The probability that such an event will affect Mississippi beaches is 13%, and the probability for Alabama is only 5% (p. 338 of the DEIS).

In conclusion, offering the 21 Mississippi/Alabama nearshore tracts in this proposal will increase the offsite commercial activities influencing the aesthetic quality of the island recreation lands. Commercial discovery on any of these lease tracts will stimulate and expedite additional petroleum exploration and development in close association with these island recreation lands. Although the cumulative effects of this proposal are unlikely to decrease the number of recreational users to the Mississippi/Alabama outer islands, the quality of some recreational experiences is likely to decline, especially those seeking a totally pristine ambiance on a Gulf of Mexico barrier island wilderness area. Continued interest in all potentially commercial reserves of oil and gas is likely, irrespective of the fate of the 21 nearshore tracts in this proposal.

4. Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks)

a. Description of Alternative B-4

This alternative would delete two tracts (67-224 and 67-225) immediately adjacent to the East and West Flower Garden Banks, respectively. This deletion option would remove only 0.4% of the tracts under consideration and would represent a very minor reduction in the estimated petroleum reserves to be offered. It would also eliminate the chance of a nearby gas blowout resuspending a large amount of sediment, which could possibly harm the biota of the banks. The banks are an exceptional coral structure in the Gulf of Mexico region.

Section III.B. discusses these biologically sensitive areas, and Section I.C.2.b. describes and discusses the stipulations that would be appended to the lease for each of these tracts. DOI believes that these tracts can be offered to and explored and developed by the oil and gas industry with no harm resulting to the biota of these areas provided that the stipulations cited in Section I.C.2.b. are imposed.

b. Summary of Environmental Consequences for Alternative B-4

The consequences of deleting these two tracts would be to remove the potential for damage from oil and gas operations, such as smothering of benthic organisms, reduced photosynthesis, lethal and sublethal toxic effects, and direct mechanical damage, to the biota of the Flower Garden Banks which could occur as a result of these tracts being leased. Other leases in the immediate vicinity of the Flower Garden Banks are active, and operations on these tracts do offer some threat to the Banks. Leasing of these two tracts would increase that threat.

c. Conclusion for Alternative B-4

It is concluded that deletion of these tracts would remove the potential for damage to the Flower Garden Banks or their biota due to oil and gas operations above and beyond the threat already existing from operations on tracts already leased in the area.

d. Cumulative Impact for Alternative B-4

Deletion of these tracts will eliminate the potential for cumulative environmental impacts at the Flower Garden Banks due to oil and gas operations. Leasing of these tracts will result in a cumulative increase in the potential for environmental impacts at the Flower Garden Banks as a result of increased oil and gas activities in the vicinity of these banks. These environmental impacts include smothering of benthic organisms, reduced photosynthesis, lethal and sublethal toxic effects, and direct mechanical damage to the biota of the Flower Garden Banks.

C. Alternative C (Delay the Sales)

1. Description of Alternative C

Delay the sales is addressed as an alternative for either or both sales because it has occurred in past OCS lease sales in other areas. While there are no specific issues in the Gulf of Mexico area known at this time which may cause a delay, it is possible that the sales could be delayed for reasons which may occur before the sales are finalized.

Delaying the sales could withhold tracts for an indefinite period of time. Historically, no extension date has been given and the time assumed for these sales is between 1-2 years.

This alternative would allow consideration of the areas proposed for sale for inclusion in the pending proposed marine sanctuary, free of oil and gas activity.

2. Summary of Environmental Consequences for Alternative C

There are both positive and negative impacts associated with this alternative. On the positive side, impacts discussed for Alternative A would be delayed; however, once the sales are reinstated those same impacts would likewise apply.

This delay period could allow additional time for completion and/or development of environmental studies currently being conducted/planned (Section I.F.). During this same timeframe, new technological information may become available which could enhance greater resource recovery technology to provide more domestic energy production.

Industry activities parallel DOI's Final 5-Year OCS Oil & Gas Leasing Schedule (Figure I-7) which is used as a timeframe for planning investments and exploration and development projects. Likewise, many smaller ancillary businesses are correlatively subcontracted by the oil companies. A delay of 1-2 years would, in all probability, impact the smaller industries to a greater extent than the larger ones, since their viability revolves around ongoing industry operations. Also, investments made by the industries in developing preleasing tract information upon which bidding decisions are made are held in abeyance until the sale is reinstated.

Any employment which would have resulted from the sales will not occur for the length of the delay. Since most employment initially occurs during the exploration phase within local service industries, incomes would be lost by the prospective workers for the delay period and, consequently, any revenues to the states as well as potential public services to the community will also be delayed.

Other environmental impacts could occur during the lightering and tankering of imported oil which would probably be tankered to the Gulf of Mexico. This will statistically increase the risk of a large oil spill occurrence (Section IV.C.1.). There also exists the possibility than anchor damage could occur to biologically sensitive areas due to tankering operations. If alternative domestic energy resources are used (coal, nuclear, etc.), environmental damage could potentially be greater than OCS activity impacts. These impacts have been discussed in DOI's 5-year FEIS schedule mentioned above.

It is estimated that approximately 30 platforms which function as high-profile artificial reefs will be installed on the OCS as a result of these proposed sales. The potential for enhanced recreational fishing at these sites may be lost for the period of the delay.

3. Conclusion for Alternative C

During the period of the delay, all impacts of Alternative A will be held in abeyance. Any alternate energy which may ultimately be utilized to replace lost potential resource development would also have associated environmental impacts.

4. Cumulative Impact for Alternative C

There would be no additive impacts during the delay period.

D. Alternative D (Withdraw the Sales - No Action)

1. Description of Alternative D

Withdrawing a sale equates to taking no action. The potential for development of tracts within the scheduled timeframe is foregone as is the economic considerations discussed in Alternative C. However, there are two courses of action which could occur to eliminate or alleviate some of these losses; namely, industry's prerogative to renominate any of those tracts for inclusion in a future OCS sale in that same area and the Secretary's prerogative to include any or all tracts in the proposed notice of sale for a future Gulf of Mexico sale.

Regarding the Secreatary's option to include withdrawn tracts in a future sale, it should be noted there is generally a 1-2 month period between a sale date for one area sale and the proposed notice of sale for the next. If Sale 67 tracts are withdrawn during February 1982, and time permitting, the Secretary could include any of those tracts in the proposed notice of sale for Sale 69 which would also occur that same month. If Sale 69 tracts are withdrawn during November 1982, they could be included in the notice scheduled two months later for Sale 72 or twelve months later for Sale 74. Although inclusion of all withdrawn sale tracts is possible, it is highly unlikely that tracts approximating 2½ million acres would be added with such short notice to industry.

2. Summary of Environmental Consequences for Alternative D

Any impacts, both positive and negative, which would have occurred under Alternative A would be canceled. These impacts would affect biologically sensitive areas, the Florida manatee, recreational fishing, and coastal and marine birds that are addressed in Section II.A.2. Employment and population impacts are addressed in Section IV.C.4.

If the withdrawn tracts are renominated and leased in a later sale, the impacts occurring would be as described in Alternative A, dependent upon any new or additional information which becomes available during the interim period. If tracts are not included in an upcoming sale, preleasing costs incurred could be forfeited or passed on to the consumer.

Withdrawing the sales may necessitate importation of foreign oil as an alternative source to replace lost domestic production; however, there would be an increased risk of oil spills caused by tankering the oil. It is difficult to predict the extent to which this replacement may be necessary since other factors are involved, such as the continuing success of energy conservation by the American public, overcoming technical and economic barriers which presently exist in other alternative energy sources, and advancing resource recovery methodologies to increase the rate of recovery. For more information on these alternative approaches to our nation's energy needs, refer to the following: (a) *Energy Alternatives: A Comparative Analysis* (Oklahoma, University of, 1975) which was prepared under contract for BLM and (b) *Final Environmental Statement, OCS Sale 58* (USDI, BLM, 1979). Based upon the mean risked undiscovered resources estimated by USGS for proposed OCS Sales 67 and 69, Table II-1 presents the energy equivalents which may be required from alternative energy sources should these sales be permanently canceled. For the purpose of clarity, this discussion has separately identified each potential alternative source of energy regarding substitution requirements; however, it is unlikely that there would be a single choice between these alternative sources, but instead some conbined effort to further explore and develop many or all of these forms as a substitute for OCS oil and gas production.

Table II-1

Replacement Energy Needs

		Billion Btu
1.	Btu equivalents:*	
	Oil (Total Risked Mean) - 77.2 million barrels	432,320
	Gas (Total Risked Mean) - 1,526.6 billion cubic feet	1,558,695
	Total	1,990,979
2.	Oil equivalents:*	Million Barrels
	Oil from other sources needed to directly replace expected oil production	77.2
	Oil from other sources needed to replace expected gas production	278.3
	Total	355.5
3.	Gas equivalents:*	Billion Cubic Feet
	Gas from other sources needed to replace expected oil production	423.4
	Gas from other sources needed to directly replace expected gas production	1,526.6
	Total	1,950.0
4.	Coas equivalents:*	Million short tons 83.0
5.	Electrical equivalents:*	Megawats of capacity
	Substitutes for end uses**	1,804.1
	Substitutes as input to electricity generation***	1,110.2

Notes: * Conversion factors used:

1 barrel of oil = 5.6×10^6 Btu.
1 cubic foot of natural gas = 1,021 Btu.
1 ton coal = 24×10^6 Btu.
1 kilowatt hour = 3,412 Btu at the theoretical conversion rate of other energy forms to electricity at 100% efficiency.

** Based on a 65% average efficiency of end use of oil and gas (such as oil and gas heating) and a plant load factor of 80% average plant life of 30 years.

*** Efficiency of fossil fuel electricity generation was assumed to be 40%. Efficiency of present fossil fuel generation averages about 33%. Plant load factors equals 80% average plant life of 30 years.

The loss of the potential oil and gas which could have been produced if the sales had not been withdrawn may have to be replaced by alternative energy sources. The most likely alternative would be imported oil since most other alternative sources have not yet become economically feasible. (See FEIS on the Proposed Five-Year OCS Oil & Gas Lease Schedule published June 1980 for more details about alternative energy sources.) The amount of oil imported would depend on national decisions and the effects of conservation measures undertaken; however, it should be noted that importing foreign oil is not in accord with the President's commitment to decrease our dependence on foreign oil.

3. Conclusions for Alternative D

The environmental impacts discussed in Alternative A will not occur; however, should any of these tracts be included in a later sale, associated environmental impacts will also be in effect. If they are not included, pre-leasing costs could be foregone or passed on to the consumer.

4. Cumulative Impact for Alternative D

There would be no additive impacts to those already existing.

E. Alternative E (Reoffering of Tracts from Sales A66 and 66)

1. Description of Alternative E

In the past, tracts rejected from a sale have sometimes been reoffered in an upcoming area sale. For that reason, an alternative is included to alert the public that tracts may be reoffered from Sale A66 after publication of the DEIS and from Sale 66 after publication of the FEIS. The tracts from Sales A66 and 66 are scheduled to be offered in July and October 1981, respectively, and could be reoffered in Sales 67 and 69.

Reoffered tracts from Sale A66 will be addressed in the FEIS on a tract specific basis utilizing any additional information obtained since the analysis was completed for Sale A66.

Since Sale 66 (October 1981) will be held after the FEIS has been published (August 1981), specific tracts to be reoffered in Sales 67 and 69 will not be known prior to publication. Nevertheless, any tracts which may be reoffered as a result of Sale 66 will also be reanalyzed at that time considering any additional information available. This information will be contained in an EA and also in the SID which will be made available to the public upon request. A notice advising the public of all pertinent information relative to any reoffered tracts will also be published in the *Federal Register*.

2. Summary of Environmental Consequences for Alternative E

The environmental consequences are as described in the FEIS for Sales A66 and 66.

3. Conclusion for Alternative E

The environmental consequences are as described in the FEIS for Sales A66 and 66.

4. Cumulative Impact for Alternative E

The environmental consequences are as described in the FEIS for Sales A66 and 66.

F. Comparison of Alternatives

Table II-2 provides a summary of the environmental effects of the proposed action (Alternative A), the potential deletions (Alternatives B-1, B-2, B-3, and B-4), delaying the sales (Alternative C), withdrawing the sales (Alternative D), and reoffering of tracts from Sales A66 and 66 (Alternative E).

Table II-2

Comparison of Expected Environmental Effects of the Various Alternatives

ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES

	A	B. Deletions of Certain Tracts as Indicated				C	D	E*
Significant Issues and Major Areas of Concern	The proposed action. Hold the sales as proposed. No. of tracts involved: 472	B-1: Biologically sensitive areas. No. of tracts involved: 126	B-2: Areas with water depths greater than 400 m. No. of tracts involved: 90	B-3: Nearshore tracts. No. of tracts involved: 21	B-4: Two tracts near the East and West Flower Garden Banks. No. of tracts involved: 2	Delay the sales. No. of tracts involved: 472	Withdraw the sales (No Action). No. of tracts involved: 472	Reoffering of Tracts from Sales A66 and 66
Biologically Sensitive Areas	Adverse impacts very unlikely	Precludes any potential adverse impacts	Precludes any potential adverse impacts	Precludes any potential adverse impacts	Precludes any potential adverse impacts	Postponement of potential adverse impacts which are very unlikely	Precludes any potential adverse impacts	
Florida Manatee	Negligible adverse impacts with a very low probability of occurrence	Removal of any impacts due to vessel collisions	No effect on manatees or manatee habitat	No effect on manatees or manatee habitat	No effect on manatees or manatee habitat	Postponement of potential adverse impact which has a very low probability	Precludes any potential adverse impacts	
Recreational Fishing	Expanded recreational fishing opportunities, probability of occurrence very high	Slight decrease in beneficial impacts to recreational fishing due to reduced oil rig construction	Slight decrease in beneficial impacts to recreational fishing due to reduced oil rig construction	Moderate decrease in beneficial impacts to recreational fishing due to reduced oil rig construction	Slight decrease in beneficial impacts to recreational fishing due to reduced oil rig construction	Postponement of beneficial impacts to recreational fishing	Precludes beneficial impacts to recreational fishing	
Coastal and Marine Birds	Minimal adverse impacts to brown pelicans with a very low probability of occurrence	Moderate reduction of potential adverse impacts in the eastern Gulf region	Minimal reduction of potential adverse impacts to marine birds	Minimal reduction of potential adverse impacts to coastal birds	Minimal reduction of potential adverse impacts to marine birds	Postponement of potential adverse impacts which has a very low probability	Precludes any potential adverse impacts	

* Environmental effects of Alternative E are unknown since the tracts are unknown at the present time. For a discussion of potential impacts, see the FEIS for Sales A66 and 66.

There are four significant issues and/or major areas of concern in connection with these sales. These issues include biologically sensitive areas, the Florida manatee, recreational fishing, and coastal and marine birds. Alternative A is unlikely to have adverse impacts on biologically sensitive areas chiefly by virtue of the biological stipulations which are applied should any of these areas be developed for oil and gas production. The Florida manatee and coastal and marine birds are also not likely to be adversely affected as a result of these sales due to the low probability of an interaction between oil and gas activity and these animals. On the other hand, recreational fishing is expected to benefit from oil and gas development once rigs have been constructed. These structures serve as artificial reefs and will attract a variety of sport fish species.

Alternatives B-1, B-3, and B-4, with their potential deletion of biologically sensitive areas, deepwater areas, and nearshore tracts, would preclude any adverse impacts to biologically sensitive areas and will significantly reduce potential adverse impacts to the Florida manatee due to reduced boat traffic to offshore areas. Coastal and marine birds will also be exposed to less oil and gas related human activity, thereby further reducing the livelihood of adverse impacts. The potential deletion of these 149 tracts would cause a reduction in the total number of oil and gas structures and, consequently, a potential reduction in recreational fishing.

Delaying the sales (Alternative C) would pospone any potential adverse impacts to the biota until such time when the tracts for these sales will be offered at the later date. The severity of the potential adverse impacts will have to be evaluated at that time. Beneficial impacts to recreational fishing in this region will not occur, of course, at this time under this alternative.

Withdrawal of the sales (Alternative D) would preclude any oil and gas related adverse impacts to the biota as a result of these proposed sales. Also, the beneficial impacts to sport fishing would not occur under this alternative.

Section III

Affected Environment

III

III. AFFECTED ENVIRONMENT

A. Physical

1. Continental Margin

The continental margin of the northern Gulf of Mexico extends from De Soto Canyon to northern Mexico and from more than 300 km inland in the central Gulf coast to the deep Gulf floor. It is composed of a broad wedge of Mesozoic and Cenozoic strata that accumulated almost continuously from Jurassic time to the present. Mesozoic and Cenozoic deposits are more than 15 km thick beneath the lower coastal plain and adjacent continental shelf. For the most part, the margin is a Cenozoic clastic platform built by the inpouring of sediments from the continental interior after the Late Cretaceous-Paleocene Laramide orogeny. Sediment supplies generally exceeded the subsidence rate, prograding the seaward face of the margin more than 400 km from the edge of Cretaceous carbonate platform deposits under the coastal plain to the present position of the continental slope. Along the inner regions of the coastal plain from Alabama to southwestern Texas, updip members of Mesozoic and Cenozoic units rest unconformably on complexly folded and faulted Paleozoic rocks of the Ouachita and Appalachian tectonic belts.

Major structural anomalies affecting the Mesozoic-Cenozoic sequence of the coastal plain, shelf, and slope are the salt diapirs, growth faults, and shale uplifts. Salt structures are concentrated in interior basins in the inner coastal plain along the lower coast from central Texas to De Soto Canyon and across the continental shelf to the foot of the slope. Regional systems of growth faults slice through Cenozoic units beneath coastal Texas and Louisiana and the adjacent shelf. Many of these faults formed as a response to sediment overloads along Tertiary and Quaternary shelf edges, to differential compaction associated with abrupt changes in sediment thickness and gross lithology, and (locally) to the withdrawal of large volumes of salt from depth during diapiric growth.

The continental margin of the eastern Gulf of Mexico is dominated by the Florida platform, which is composed of a thick accumulation of bathyal to neritic carbonate rocks and evaporite deposits of Mesozoic and Cenozoic age. The platform is fronted by a prominent escarpment built by shelf-edge reef complexes during the early Cretaceous. The northern half of the platform was built on a continental foundation composed of upper Precambrian and lower Paleozoic igneous and metamorphic rocks and capped by undeformed clastic sediments of Ordovician, Silurian, and Devonian age. Triassic red beds and associated diabase are common in the extensive graben systems that underlie northwestern Florida. Southern peninsular Florida is underlain by basement composed of volcanic and hypabyssal rocks of Triassic and early Jurassic age. Geophysical data suggest similar basement complexes beneath the west Florida shelf and slope (Martin 1978).

2. Geology

The geologic conditions of the seafloor are hazardous for man's activities when structures cannot be designed to withstand the stresses of the continental shelf environment. Basically, geologic conditions which may be hazardous relate to seafloor stability, potential for movement, and frequency. Three conditions prevail in the Gulf of Mexico which cause unstable conditions on the seafloor:

(1) salt movement which may result in salt domes, faults, steep slopes, gas seepage, and sediment slumping;

(2) sediment overloading and differential compaction causing growth faults and differential subsidence; and

(3) rapid sedimentation in deltaic areas that results in unconsolidated, fine-grained, often gas charged sediments.

Most structures and equipment used for minerals exploration and development can be designed to withstand the stresses of the continental shelf environment if adequate information is available. BLM's Environmental Studies Program has been especially directed toward areas where more detailed geologic information was needed for intelligent management of the OCS mineral leasing program. A summary for each area follows:

a. West Florida Shelf

The west Florida shelf has a thin surface veneer of unconsolidated sediments with little active sedimentation since the Pleistocene. Seafloor variations have been a result of changes in world climates and the glacial eustatis fluctuations of sea level over the past 15-20 million years. The geologic record and historical record indicate that this is one of the most seismically stable areas in the world.

Geologic hazards are present on the west Florida shelf and consist of: (1) karst and (2) unstable slopes.

(1) The karst is formed in porous Eocene limestone strata over 600 m thick found between 180-300 m below the shelf's surface. The karst consists of concentrations of dolines (sinkholes) formed by either solution of surface limestone or by collapse of underlying solution caverns, and a rough barren topography which refers to surface solution into deep furrows or channels.

(2) Unstable slopes are noted at the shelf break into the abyssal plain and are more common on the slope at the northern edge of the west Florida shelf in the vicinity of De Soto Canyon.

BLM's MAFLA studies of 1976-1979 have provided geologic information for the west Florida shelf as a base for the survey and research of the marine environment. The survey and research in progress by USGS, Corpus Christi, in the eastern Gulf will provide a better accounting of the shelf's geology and a base for future hazards study.

b. Mississippi Delta

The area around the Mississippi Delta has high potential for adverse geologic conditions that could affect oil and gas exploration and production. Sediment discharge from the Mississippi River, predominantly fine sand and clay, is estimated to be 684 million tons per year. For more than 30,000 years this sediment has built a series of deltas reaching near the edge of the continental shelf. Because discharge patterns differ seasonally, sand, clay, and organic matter alternate and interfinger. The pattern formed is one of a large sediment mass composed of sands and clays that were deposited rapidly with high water content and abundant organic material. The fine-grained material is being deposited so rapidly that gases from the decayed organic matter become trapped to form a highly underconsolidated gas-saturated sediment. These sediments may be moved initially because of high river flood stages, storm wave action, degassing of the sediments, and faulting. Once movement is initiated, material will flow under the influence of gravity. These flows form a natural extension of the Mississippi Delta and cover much of South Pass and parts of Main Pass, West Delta, and Mississippi Canyon lease areas.

BLM's Open-File Reports 80-01 and 80-02, section entitled "Subaqueous Sediment Instabilities in the Offshore Mississippi River Delta" (Coleman, et al., 1980) and the accompanying maps provide a regional overview of sediment instabilities that exist on the shelf off the modern Mississippi River Delta.

This report is the result of work begun in 1974 as a joint research program between Louisiana State University, USGS, and BLM.

c. Mississippi/Alabama Shelf

This is an active prograding area strongly influenced by the Mississippi River. Thick accumulations of fine-grained sand and silt dominate the Mississippi Sound-Mobile Bay area, grading into courser quartz sands to the east.

This area is associated geologically and physiographically with the Louisiana and Texas continental margin. The geohazards of the region are similar:

(1) Growth faulting extending from midshelf to the foot of the continental slope is quite common between Horn Island and Pensacola.

(2) Salt plug intrusions are found from De Soto Canyon to the Mississippi River Delta, although not as numerous further to the west.

(3) The continental slope from the Mississippi River Delta to De Soto Canyon is marked by sediment instability in the form of active mudflows, slumping, and erosional furrows and gullies.

Survey work and research to document the outer shelf and slope faulting and sediment instability are in progress under a joint program between Louisiana State University, USGS, and BLM. This research is scheduled for completion in 1982.

d. Environmental Geology of the Continental Shelf Edge and Upper Continental Slope off Southwest Louisiana

Geographically, the overall area studied is seaward of the coast of east Texas and Louisiana. Dimensions are 200 km east-west and 90 km north-south, prescribing a total area of 18,000 sq. km or approximately 817 lease blocks. Physiographically, the northern half of the area is underlain by the outer part of the continental shelf and the southern half by the upper part of the continental slope where the gradient of the seafloor increases toward the deeper parts of the Gulf. Water depth north to south ranges from about 50-700 m. Geologically, the regional setting is that part of the outer continental terrace that includes the main Pleistocene depocenter in the northwest Gulf of Mexico, commonly referred to in petroleum exploration as the "Pleistocene Trend." Thickness of the Pleistocene sequence, as constructed from drill hole data, exceeds 3,500 m. The interactions of rapid sedimentation, abrupt fluctuations of sea level during the Pleistocene, and continuing salt diapirism have caused rapid progradation and evolution of the shelf edge. These features, in combination with the increase in seafloor gradient at the edge of the shelf, create potentially hazardous conditions of a geological nature that must be considered carefully by DOI in appraising sites for petroleum production platforms and pipelines.

Geologic features deserving special attention where the safety aspects of prospective exploration and production sites are being considered are as follow:

(1) Gas at shallow depth -- The acoustical response of the sediments suggests that gas is widely distributed. Amounts of gas are not known, but site-specific studies should be considered where shallow gas is indicated.

(2) Buried stream channels -- Depositional structure and texture are highly variable in sediments filling old stream channels. Commonly, these variations occur over short distances, both laterally and with depth, causing equally abrupt changes in cohesiveness and bearing strength. Also, sediments in buried channels may contain organic material that will generate biogenic gas.

(3) Active faults -- Most of the faults reach the seafloor or terminate just below it. Scarps along some of the faults indicate relatively recent movement; offset of the most recently deposited sediments confirms that gravity and tectonic adjustments within the submerged continental margin are a continuing process. The history of fault movement revealed by the acoustical profiles shows progressively greater offset of reflectors at depth along most of the faults, indicating repeated movement over a substantial period of time.

(4) Surficial and shallow deformation -- Surficial slumping or sliding, if active, is a very restricted phenomenon. Surface deformation has been caused primarily by faulting, which in turn is most common on and around the diapiric folds. The buried slumped sediments are extensive and could pose problems for production platform footings.

(5) Diapirs and faulting -- Diapiric structures dominate the upper continental slope. In some areas, in addition to vertical movement, the diapiric material, presumably salt, also seems to be creeping laterally as very large deep-seated slumps. No data exist for estimating rates, magnitude, frequency, or diapiric movement. Empirical evidence based on the stratigraphy and relative configuration of upturned strata around the diapirs indicates uplift of some 145 m during and since the late Pleistocene. The numerous fault scarps on and around the diapiric hills and local displacement of terraces on the hills strongly indicate relatively recent movement (Berryhill, 1980).

e. Flower Garden Banks

The East and West Flower Garden Banks, located in the northwest Gulf of Mexico OCS, have been mapped in detail. A set of nine maps has been constructed with the cooperative efforts of researchers at USGS, Corpus Christi, Texas; Texas A&M Oceanography Department, College Station, Texas; and BLM, New Orleans, mapping specialists. The following discussion is a summary of Section II of a study conducted by Trippet (1980). The biology of these banks is discussed in Section III.B.2.a.

> The Flower Garden Banks are the two largest of more than 130 calcareous banks in the northwest Gulf of Mexico that form topographic elevations on the otherwise generally smooth continental shelf.
>
> Geophysical data from four sources were used in the study. Approximately 570 km of high resolution seismic profiles were collected during two surveys conducted for USGS, Office of Marine Geology, Corpus Christi, Texas. All additional 271 km of similar data were provided by the Conservation Division of USGS, Metairie, Louisiana. The Conservation Division data cover six lease blocks on West Flower Garden Bank, four on East Flower Garden Bank, and one block in an area of extensive drowned patch reefs. The track line spacing is about 0.8 km by 2.4 km. These three surveys included both sparker and 3.5 kHz seismic systems operated simultaneously. Texas A&M University's Department of Oceanography provided nearly 469 km of both uniboom and 3.5 kHz records over West Flower Garden Bank and 205 km of uniboom records over East Flower Garden Bank, both spaced at approximately 300 m intervals.
>
> Water depths range from less than 20 m at the crest of East Flower Garden Bank to over 270 m south-west of West Flower Garden Bank. The bathymetric contours drawn at 10 m, provided by Texas A&M University, are based on seismic data and large-scale (1:12,000) topographic maps of East and West Flower Garden Banks. Faults shown on the bathymetry map are those that intersect the seafloor; faults covered by younger sediments are shown on the map for geologic structures.
>
> The topography of both Flower Garden Banks is essentially fault-controlled. East Flower Garden Bank rises 80 m above a wide, flat plain lying at a depth of 90-100 m. The dimensions of East Flower Garden Bank are 6.5 km east to west and 9.7 km north to south. The bank is asymmetrical with greatest relief along the southeastern flank where water depth increases from 50-130 m over a distance of one kilometer.
>
> Both diapirism and faulting are considered to be active processes in the Flower Garden Banks area. A comparison of faults intersecting the seafloor with those that terminate below it shows that most faults continue to be active; post-Wisconsin sediments within the area are offset by faulting. Diapiric uplift seems to be characterized by periods of gradual salt movement alternating with periods of quiescence; therefore, lack of present observable activity is not a reliable indicator of future inactivity. Evidence of regional diapiric movement and active faulting indicates the Flower Garden diapirs are tectonically active.
>
> Faulting around the Flower Garden Banks appears to be the result of a combination of diapirism and sediment loading. Diapiric uplift of the seafloor controlled the drainage pattern across the exposed land surface during low stands of sea level, channeling sediment-laden streams into interdiapiric basins which in turn subsided further, at least partly, in response to the weight of sediment overburden.

There is evidence of chaotic sediments deformed by salt movement. The salt source for the diapirs is estimated to be at least 10-12 km below the seafloor (Martin, 1978), but the depth of penetration of the high resolution seismic records is only about 300 m below the seafloor. Diapiric salt is only seen on the seismic records as isolated fingers that have penetrated the overlying sediments in several small areas on the crests of diapirs.

East Flower Garden Bank is underlain by an asymmetrical diapiric core that has caused steepening of the southern and eastern flanks accompanied by concentric faulting. Salt appears to reach the seafloor surface near the southeastern edge where a brine seep was observed from the Texas A&M submersible Diaphus (Bright and Rezak, 1979, personal communication).

West Flower Garden Bank is topped by three crests separated by grabens. Graben fault systems are common on the crests of salt domes and usually are aligned parallel to the long axis of the structure as on West Flower Garden Bank.

The synclinal depressions associated with East and West Flower Garden Banks probably were formed by the withdrawal of salt at depth to feed the central core, a process augmented by sediment loading in the interdiapiric basins. Similar rim synclines caused by salt withdrawal have been noted by Halbouty (1967, pp. 27-40). The anticlinal axes between diapirs probably indicate salt ridges buried beyond the penetration range of the high resolution seismic system.

Gas seeping into the water column and mud vents or mud volcanoes caused by gas escaping from the seafloor were mapped where identified on seismic records. Gas seeps on the Flower Garden Banks are intermittent; consequently, a seismic profile may not record all active gas seeps.

The youngest unconformity in the Flower Garden area probably represents the base of sediments deposited since the last low stand of sea level (Berryhill, 1980). The post-Wisconsin sediments are limited in areal extent and vary in thickness from 0-20 m. The unconformity is actually a disconformity in many places because the base represents a change in the magnitude of deposition and direction of transport rather than erosion.

A second, deeper unconformity pinches out around the flanks of both Flower Garden Banks (zero contour line). The strong reflective character of this surface, the angularity of bedding planes beneath it, and the conformable, largely parallel bedding of the sediments above it are indicators of an ancient land surface that has been weathered, eroded, and subsequently covered by younger sediments. The distinctive angularity of bedding planes beneath this unconformity implies tectonic activity (probably salt diapirism) that caused a marked change in topography at that time.

Prograded foreset bedding is apparent in the sediments above the unconformity north and west of West Flower Garden Bank, indicating deltaic sediments deposited by an extensive river system when most of the area was near sea level. Sediments eroded from the diapirs contributed to deposition, and the unconformity was ultimately buried by as much as 110 m of sediment in the interdiapiric basins.

Extensive areas of drowned reefs up to 22 m thick have been documented on both banks. Many of the drowned reefs grew initially on the ancient surface now represented by the prominent unconformity. In the area southwest of East Flower Garden Bank, several small diapiric fingers apparently raised the seafloor sufficiently to enable most ancient reefs to survive some localized deposition; however, they could not grow fast enough to escape drowning by rising sea level.

A large number of reefs buried under younger sediments are located on the lower flanks of the Flower Garden Banks and in the area in between. Most of the buried reefs grew on the ancient erosional surface at a time when it was covered by warm, shallow water.

f. South Texas Continental Shelf and Continental Slope: Late Pleistocene/Holocene Evolution and Seafloor Stability

The summary that follows describes the geologic aspects of a multidisciplinary systematic regional environmental survey made of the OCS off south Texas for BLM. The complete environmental study may be found in "Environmental Studies, South Texas Outer Continental Shelf 1976-Geology," (Berryhill, 1977).

(1) Geologic Characteristics of the Region

(a) Structural Framework of the Continental Terrace

— Folds -- series of northeastward-trending folds identified as primary structures within the continental terrace.

— Faults -- five types recognized:

- tensional breaks formed in the strata above the crests of anticlines (elongate structures);
- tensional breaks above diapirs (domal structures);
- deep-seated rotational gravity faults in the outer part of the continental terrace where sediment loading has caused the rim of the continental terrace to sag and slide basinward;
- composite tensional and gravity faults, edge of continental terrace, and upper slope; and
- shallow rotational faults associated with sliding and slumping of surficial sediments, continental slope.

(b) Evolution of the Continental Terrace Since Middle Pleistocene

General depositional history:

— Three general environments of deposition are recognized: open shelf, deltaic, and continental slope. Each has distinctly different sedimentary characteristics.

— In general perspective, the outer edge of the continental terrace has grown progressively seaward as a result of the large influx of clastic sediments. The principal factor that has shaped the geomorphic profile of the terrace has been the climatically controlled fluctuations of sea level. Sea level has risen and fallen cyclically over a range of some 100-150 m during Pleistocene time.

— The geomorphic extent of open shelf versus deltaic deposition has varied widely because of the changes in sea level. Sedimentation has been principally deltaic during the glacial epochs when the shelf was exposed as land surface and open shelf during the interglacial epochs when the sea rose and spread landward across the shelf. Deposition has been continuous over the slope but the amount and type of sediment deposited there has varied considerably as the result of the migrations of the shoreline.

— Previous low stands of sea level are represented on the acoustical analog records as strong reflecting surfaces that are irregular and nonconformable to the sediments above and below.

— The nonconformities represented by the strong sound-reflecting surfaces define four late Pleistocene/Holocene depositional units on the shelf. The distribution and thickness of the units, in essence the depositional history of the shelf for the time period specified, are shown by the series of isopach and structure contour maps. The isopach maps show the thickness of the units; the structure contour maps show the configuration and depth below sea level of each of the unconformities that define the depositional units.

Holocene deposition:

— The Holocene deposits record the transgression of the rising sea across the shelf from the last low stand. The older Holocene deposits making up the basal part of the unit probably represent different environments from the more recent open shelf deposits.

— The overall thickness of the Holocene sediments is related to the structural fabric of the continental terrace; the structural grain influences both the directions of sediment transport and the sites of deposition.

- The nature (composition and grain size) of most of the Holocene sediments is not known from actual observation, but the seismic records suggest that, except for the basal deposits that seem to vary, the makeup probably is similar to that of the shallow subsurface Holocene deposits penetrated by gravity cores. The several depositional environments of the shelf are represented by the cores: inner shelf, mid-shelf, outer shelf, and relict deltaic.

- Thin discrete layers of sand are typical of the shallow subsurface deposits over the inner half of the shelf. The stratigraphic recurrence and wide geographic distribution of the discrete sands suggest periodic, relatively rapid water movement or high energy conditions over large parts of the shelf. Hurricane passage may be the principal mechanism by which the sand is distributed beyond the surf and shoreface zone.

- Distribution of surficial sediments by grain size indicates that silt is the predominant textural component. Relict deltaic and ancient shoreline deposits of sand are on the southern and northeastern parts; otherwise, the variations in regional grain size are what might be expected on empirical grounds—increase in the sand-sized fraction shoreward and increase in the clay-sized fraction seaward. The shelf as a whole is a region of typically fine-grained sediments.

- Dating of the rates of sedimentation during the past few hundred years using 210Pb as the dating agent indicates that the highest rates of sedimentation have been at mid-shelf in the northern part of the south Texas OCS.

- Distribution of trace metals in the surficial bottom sediments indicates two relationships relative to sediment grain size—increased abundance in the finer grained sediments and increased abundance around certain estuaries where anthropogenic induction is suspected. The use of barium content of the sediments in conjunction with 210Pb dating indicates that sediments are being carried primarily from north to south and obliquely across the south Texas OCS. The barium content of the sediments began to increase in the 1920's as oil well drilling increased. Thus, it is an ideal tracer element for measuring rates and patterns of sediment movement.

Tectonism:

- Most faults are of the growth type. Relative offset along the faults increases downward with increasing subsurface depth indicating continued movement through time.

- Faulting, though relatively continuous over the broader span of time from the middle Pleistocene to the present, appears to have been episodic when viewed in shorter increments of time, possibly as a result of the cycles of the alternating periods of glacial sea level withdrawal and interglacial deposition.

- Faulting during the Holocene has been concentrated along the outer edge of the continental shelf.

(2) *Relative Stability of the Seafloor*

(a) General Classification of the Shelf and Slope

Subarea 1

- Generally stable. No movement is apparent over most of the inner half of the shelf in post middle-Pleistocene time. In the southern part of the OCS, recent faults cross the shoreline from shelf to coastal plain; the faults are expressed at the seafloor as topographic ridges.

- Movements at mid-shelf have decreased during the late Pleistocene but localized fault movement along the crests of folds is indicated. Faults reach the seafloor at isolated sites.

Subarea 2

— Generally stable. Faulting has been both extensive and intensive over the outer third of the shelf in the central sector of the OCS during the Holocene.

— The faulting along the outer shelf has been caused by the combination of sediment loading and isostatic adjustment; subsidence has been countered to a degree by the buttressing effect of a rising anticline whose crest lies just beyond the shelf edge beneath the upper most part of the continental slope.

— Gravity slumping of sediments and associated shallow faulting is evident in the southern and northeastern parts of the OCS near the shelf edge and on the adjacent uppermost slope.

Subarea 3

— The continental slope has been a mobile area, and relative instability is indicated. Mobility has been primarily of two types: massive, large-scale gravity slumping of relatively soft sediments down the increased topographic gradient of the continental slope and diapiric movement of salt.

— Some of the rotational, gravity faulting on the slope does extend to considerable depth in the subsurface, indicating the tendency for the entire outer part of the continental terrace to slide toward the deeper central part of the Gulf of Mexico because of sediment outbuilding and loading.

— The relative instability at the shelf edge and on the continental slope is primarily a function of the increased topographic gradient which in turn relates to the adjustments caused by sediment buildup and overloading.

(b) Analysis of the Unstable Conditions in Subarea 3, Shelf Edge, and Adjacent Continental Slope by Geographic Sediments from South to North: Southern, Central, and Northeastern

Southern

— Geologic characteristics: edge of ancestral Rio Grande delta coincides with shelf edge; increase in seafloor gradient; slumped and diapirically deformed sediments of a generally chaotic nature lie beneath younger prograded and undeformed sediments; shallow faults are associated with surficial slumping and sliding; and deep-seated gravity faults are also associated with broader scale basinward slumping.

— Types of instability and potential hazards:

- Buried, older slumped and chaotic sediments beneath prograded undisturbed sediments - Potential for over-pressured zones and high gas content.
- Surficially slumped and faulted sediments along edge of shelf/uppermost slope.
- Primarily surficial, shallow seated sliding and some slumping on the upper to middle slope.
- Large scale slump/folding and faulting on the middle to lower continental slope involving sediments to considerable depth below the seafloor surface

Central

— Geologic characteristics: subsiding edge of shelf is being countered by rising anticlinal ridge that has isolated diapirs along its trend; many deep-seated rotational faults and tensional faults; increase in topographic gradient at shelf edge is less abrupt than from south and north; and no previous surficial sliding or slumping of the sediments on the upper slope is indicated. Gas seepage in association with faults is indicated over the general outer central sector.

— Types of instability and potential hazards:

- Active anticlinal fold beneath the upper continental slope.
- Active diapirs—two along the anticlinal crest that lies beneath the upper slope and at least six large diapiric masses further seaward beneath the middle and lower slope.

Northeastern

— Geologic characteristics: edge of ancestral Brazos-Colorado River delta coincides with shelf edge; increase in topographic gradient at shelf edge relatively abrupt in contrast to the central sector; slumped and diapiric sediments lie beneath prograded younger sediments; shallow faults associated with surficial slumping; and hummocky topography caused by slumping on the continental slope.

— Type of instability and potential hazards:

- Slumped and diapirically deformed older sediments beneath prograded younger sediments.
- Slumped and faulted sediments beneath the steep upper part of the continental slope.
- Relatively steep and irregular bedding in prograded sediments along the edge of the delta.
- Intensely slumped and chaotic sediments forming a relatively thin skin above older sediments that were subjected to earlier deep-seated gravity faulting rather than large-scale slumping.

Summary

— The edge of the continental shelf has prograded younger deltaic sediments overlying older slumped sediments of chaotic structure in the southern and northeastern parts and an active anticline parallel to the edge in the central part. Faulting has been extensive over the seaward half of the shelf.

— The continental slope is a complex of deformed sediments of various types.

— Primary factors leading to instability:

- Increase in the topographic gradient at the edge of the continental shelf where it merges with the continental slope.
- Long-term and regionally high rates of deposition along the continental terrace which have, in general, caused isostatic adjustments and deep-seated gravity faulting.
- More localized high rates of sedimentation caused by deltaic outbuilding to the edge of the shelf where the combination of large volumes of unconsolidated sediments deposited on the increased topographic gradient leads to intensive slumping and sliding.
- Diapirism or the upward movement of less dense material such as salt and shale from depth. The movement of this material upward through the thick overlying sediment causes extensive deformation and the doming of the sediments above the diapiric material as it nears the surface.
- High gas content in rapidly deposited sediments.

g. Texas Inner Shelf Study

A significant study, "Sediment Distribution, Bathymetry, Faults, and Salt Diapirs-Submerged Lands of Texas," has been done by the University of Texas under the direction of R. A. Morton and J. H. McGowen. The area studied includes the state-owned submerged lands of Texas and extends from Mexico to Louisiana. The area includes the bays, estuaries, and lagoons as well as the inner continental shelf. Bottom-sediment samples and geophysical profiles are the field data that provide the basis for a multitude of studies described in this document. As stated in the study, additional analysis is needed to complete this worthwhile project.

The comprehensive investigation of the continental shelf is being conducted in order to develop a baseline inventory of geological and biological data for future environmental monitoring. The program was designed to provide basic scientific data necessary to assess and predict problems and potential impacts resulting from energy, mineral, transportation, recreation, and industrial development on the federal OCS.

As the summaries of geologic studies outlined above indicate, an order of magnitude of additional information is now available. This information is being utilized on a daily basis for the following operations:

- tract evaluation and selection;
- pipeline permit processing;
- protection of sensitive areas such as the Flower Garden Banks;
- preliminary platform emplacement; and
- pipeline routing.

BLM's Open-File Report 80-02, section entitled "Development of Oil and Gas in the Mississippi River Delta Offshore," cites several examples of the application of geologic studies and geohazard surveys to recent platform siting and pipeline routing in that particularly unstable seafloor environment.

3. Climate

The general climate of the northern Gulf of Mexico and surrounding coastal area is largely determined by four major factors: the North American continental land mass, Azores-Bermuda high pressure cell, subtropical latitude, and warm Gulf waters.

During winter the temperature and amount of precipitation are determined by alternating maritime tropical and polar air masses for unspecified periods of time. The cold polar air masses often move south into the Gulf and the fronts normally advance towards the south at about 18 knots. As they begin to be influenced by the strong flow of maritime tropical air in the south, they decrease in intensity and become somewhat stationary, influencing local conditions for about four days. These air masses bring about a sudden drop in air temperature which is often quite dramatic in nature. These stationary fronts are favorable for the formation of low centers that often move west to east along the Gulf coast and inland scattering low clouds and precipitation.

Rainfalls are generally slow, steady, and relatively continuous, often lasting several days. Snowfalls are rare, and when frozen precipitation does occur it usually melts upon contact with the ground. Incidence of frozen precipitation decreases with distance offshore and rapidly reaches zero.

The cold air temperature reduces surface water temperature offshore and influences rivers and bays, promoting the formation of fog in coastal areas from November through March when warmer air occurs. Generally, coastal fogs last three or four hours although particularly dense sea fogs may persist for several days. Poorest visibility conditions occur during winter and early spring. By spring the Bermuda high develops its influence over the area, thus, improving the weather considerably. This influence becomes stronger and more developed by summer and provides an almost impenetrable barrier to westerly storm systems.

During the summer, conditions are dictated by the strong Bermuda high. Southerly winds provide the source of warm, moist tropical air responsible for frequent precipitation in coastal and offshore areas. This is in contrast to winter when winds are predominantly from the north and east. Winds from the west are rare anytime during the year. Near the coast, winds are more variable than offshore.

Easterly waves and tropical storms appear in the Gulf during late summer and early fall. The principal paths of tropical storms into the Gulf are through the Yucatan Channel and the Straits of Florida. Over half of these tropical storms become hurricanes during this season. They have their origin over the warm tropical waters of the central Atlantic Ocean, Caribbean Sea, or southeastern Gulf of Mexico; they occur most frequently between June and late October; and there is a relatively high probability that tropical cyclones will cause damage in the Gulf of Mexico each year. Damage from hurricanes results from high winds, particularly in the coastal areas where the storm surge or tide is an abnormally high rise in water level. Maximum surge height at any location is dependent upon many factors—including bottom topography, coastline configuration, and storm intensity—but can reach 6-8 m. Hurricane Camille was the most severe hurricane in recent Gulf history with top winds exceeding 322 km/hr and barometric pressure in her eye as low as 68 cm (26.6 inches of mercury).

Average annual precipitation along the Gulf coast increases from approximately 69 cm at Brownsville to over 102 cm at Galveston and 137 cm at New Orleans. Rainfall is fairly evenly distributed throughout the year with the greatest amounts occurring during the months when the winds are predominantly out of the southeast and south, namely June, July, and August. This is not to imply a continuity of precipitation for the south Texas region. The month of maximum rainfall for most locations is July; however, at Brownsville the record maximum is in September. The warmer months usually have convective cloud systems which produce showers and thunderstorms; however, thunderstorms of this type rarely cause any damage or have attendant hail.

During October and November, the Bermuda high begins to weather and again allows continental air to influence the Gulf and coastal areas.

CLIMATIC CONDITIONS OF THE GULF COAST

Wind Speed- A) Northwestern Gulf Coast - annual mean 11-13 knots
B) Northeastern Gulf Coast - annual mean 11-12 knots

Wind Direction- A) Northwestern Gulf Coast - prevailing direction is SE
B) Northeastern Gulf Coast - prevailing direction is E

Sea Level Pressure- A) Northwestern Gulf Coast - 1,016-1,017 mb annual mean
B) Northeastern Gulf Coast - 1,018 mb annual mean

Visibility ($<$1 nmi)

A) Northwestern Gulf Coast - annual mean 0.8-1.0% frequency monthly means for high probability months

Dec.	Jan.	Feb.	Mar.	Apr.
0.8-1.1%	1.8-2.6%	1.4-1.5%	1.2-3.3%	1.2-2.2%

B) Northeastern Gulf Coast - annual mean 0.5-1.6% frequency monthly means for high probability months

Dec.	Jan.	Feb.	Mar.	Apr.
0.2-1.7%	0.2-6.1%	0.8-1.9%	1.8-6.0%	0.9-1.7%

Note: Monthly means vary according to specific locations within a general region and are expressed as a range, i.e., 0.2-1.7%.

Relative Humidity- A) Northwestern Gulf Coast - annual mean 79%
B) Northeastern Gulf Coast - annual mean 76-77%

Waves- A) Northwestern Gulf Inshore Areas - annual mean 3-4 ft, max observed 26-28 ft
B) Northeastern Gulf Inshore Areas - annual mean 3 ft, max observed 23-31 ft

Note: It would be impractical to present here an in-depth review of historical wave data in the report due to its scope and intended use. For more information, consult a climatic atlas.

For more detail on climate in the Gulf of Mexico area, see Section II.A.2 of FEIS 58A and FEIS 65.

4. Oceanography

The complex circulation in the Gulf of Mexico can be classified by two interrelated circulating systems: the large scale circulation associated with the open Gulf and its influences and that more localized, yet influencing circulation of the inshore Gulf. Since oil exploration and production is mostly in the mixing zone between these two systems, they should be equally considered. Although these two systems can be classified somewhat distinct in nature, they are by no means isolated from one another.

In general, the large scale circulation in the open Gulf is highly influenced by the Yucatan Current, tides, winds, waves, freshwater input, etc. These influences produce some very distinct yet seasonably variable circulation patterns. The most noted circulation pattern in the Gulf is the Loop Current. It is here that the Yucatan Current penetrates into the Gulf, turns clockwise, and exits through the Florida Straits. The Loop Current frequently produces eddies, as does the main current in the eastern Gulf. These eddies separate from the main current and drift out into the western Gulf while they decay over a 4-10 month period. No significant permanent or semipermanent shelf currents exist in the western Gulf as a result of the Loop Current.

The more localized inshore circulation in the Gulf is generally characterized by longshore currents, tidal influences in and around bays and barrier islands, and the rather seasonal wind division currents which are the major contributors to surface circulation.

Along the continental shelf in the northern Gulf of Mexico there is a general westward movement of currents. Surface currents in the western Gulf of Mexico shift seasonally and, in general, reflect the prevailing winds over the area. Currents from September-February are southwesterly with indications of an alongshore or offshore movement in November and December. A period of transition occurs in March-May when currents shift to the west then to the northwest. Surface current flows north and east alongshore in June and July. Finally, in August, currents are westerly before resuming the September regime.

In conclusion, currents in the Gulf of Mexico are predominantly influenced by wind in the western portion and by density differences and the Loop Current in the eastern portion. During the summer the Loop Current extends far into the northern Gulf causing an easterly flow past the slope off the Mississippi Delta. A counter current caused by density gradients and wind stress flows westward nearshore along Louisiana and turns southwesterly on the Texas shelf.

The tides of the Gulf of Mexico are weakly developed and usually their observed range does not exceed 0.7 m. Semidiurnal (twice daily) tides are small; therefore, overall tides in the Gulf are considered diurnal (daily) in character. Spring tides are slightly higher, but since the range is small, meteorological effects can completely mask tidal fluctuation at times. Highest mean water level occurs during the period of December-March. Tidal currents do have some effect on flushing rates in bays and sounds due to the fact that the maximum tidal current velocity is often in excess of two knots in and around entrances to these areas.

The most noticeable effects that tidal fluctuations produce occur in combination with the localized wind driven surface currents, the freshwater input, and the longshore currents to produce somewhat irregular and unpredictable inshore circulation and mixing.

The Gulf of Mexico coastline is characterized as a low energy area in terms of wave power. The annual average wave heights are 0.9 m with 75% of all waves being smaller in height than 1.5 m.

Prevailing winds during spring, summer, and early fall are from southeast, and wave heights are generally less during this period. Waves associated with storms range considerably higher. During hurricane "Camille" in 1969, for example, waves 21 m high were reported offshore with winds exceeding 322 km/hr. For more details on physical and chemical oceanography, see Sections II.A.3. and 4. of FEIS 58A.

B. Biological Habitats

1. Coastal Zone

a. General

The Gulf coast is fringed with marshes and estuaries closely linked to the nearshore biota. Many of the estuaries and some of the nearshore areas in the northern Gulf of Mexico have marine grass beds. (For a more thorough discussion of marshes, estuaries, barrier islands, and seagrasses, see FEIS 58, Volume I, pp. II-43-45 and FEIS 65, Volume I, pp. II-50-52.) In the western Gulf the coastal zone area corresponds to the white shrimp grounds of Chittenden and Moore (1977). This zone is characterized by soft sediments and estuarine-associated fauna dominated by croakers (*Micropogon undulatus*) and white shrimp (*Penaeus setiferus*). In the eastern Gulf the zones are not as clearly defined.

b. Coastal Birds

Bird species which occur in the Gulf of Mexico coastal zone (within three miles of shore) consist primarily of three general groups: shore birds, wading birds, and waterfowl (see bird list in FEIS 65, Table II-10). Feeding and nesting areas include mainly beaches, coastal bays, marshes, and wetlands. Reproductive activity for these groups occurs from February-August (Portnoy, 1977).

The Gulf of Mexico coastal area lies in the Central and Mississippi flyways, and three to five million migratory waterfowl overwinter in the Gulf coastal wetlands (Bellrose 1976). The peak of the fall migration is November and December; spring migration occurs from March to early May. The major waterfowl habitats are coastal bays, marshes, and wetlands. The coastal national wildlife refuges and state wildlife management areas provide feeding and nesting areas for migratory waterfowl.

c. Endangered and Threatened Species

Local colonies of the Attwater's prairie chicken (*Tympanuchus cupido attwateri*) occur in the coastal prairie of the mid-Texas coast. The red-cockaded woodpecker (*Dendrocopos borealis*) is found primarily in mature, open pine forests from east Texas to Long Pine Key in the Florida Keys. Arctic peregrine falcons (*Falco peregrinus tundrius*) winter along the Gulf coast from west Texas to Florida. The whooping crane (*Grus americana*) winters from October-April on and adjacent to the Aransas National Wildlife Refuge in Texas. Mississippi sandhill cranes (*Grus canadensis pulla*) are nonmigratory and restricted to a small area in Jackson County, Mississippi, near the Pascagoula River. The brown pelican (*Pelecanus occidentalis*) occurs along the Gulf coast with small populations in east Texas (about 50), east Louisiana (about 200), and a stable population of 20,000-30,000 in Florida. The habitat of these colonial nesters are small coastal islands in salt/brackish waters. Bald eagles (*Haliaeetus leucocephalus*) occur along the Gulf coast.

The Schaus' swallowtail butterfly (*Papilo aristodemus ponceanus*) and Bahaman swallowtail butterfly (*Papilio andraeman bonhotei*) both occur in tropical hardwood hammocks around the Biscayne National Monument in southeastern Florida.

Key deer (*Odocoileus virginianus clavium*) range is restricted to the islands of the lower Florida Keys.

The American alligator (*Alligator mississippiensis*) occurs generally along the Gulf coast in marsh areas with fresh to brackish water. American crocodiles (*Crocodylus acutus*) are restricted to southern Florida, chiefly along Florida Bay and on adjacent Key Largo.

Kemp's ridley turtle (*Lepidochelys kempii*) habitat includes shallow coastal and estuarine waters often associated red mangrove along the southwestern Texas coast. This species sporadically nests in Kleberg, Kenedy, Willacy, and Cameron counties, Texas. The hawksbill turtle (*Eretmochelys imbricata*) habitat includes reefs, shallow coastal areas, and passes and are generally found in water less than 20 m deep. Only two hawksbill nestings have been reported in Florida. The leatherback turtle (*Dermochelys coriacea*) is the most pelagic sea turtle and may often be found near the continental shelf edge. Sightings have been reported along the Gulf coast in March and April, and nesting has been reported on the south Florida Gulf coast. The green turtle (*Chelonia mydas*) is found throughout the Gulf. Its favored habitat appears to be lagoons and shoals with an abundance of marine grass and algae. Nesting occurs on the Gulf coast of Florida from Marco Island south to the Florida Keys.

The loggerhead turtle (*Caretta caretta*) wanders widely throughout the Gulf of Mexico and has been found as far as 500 miles out in the open sea. Loggerheads nest on various barrier islands and beaches throughout the Florida Keys and up the Florida west coast to the Chandeleur Islands, Louisiana, in the Gulf of Mexico.

The Florida manatee (*Trichechus manatus*) range is from North Carolina to Louisiana. The present estimated population is 750-900 animals and is mostly concentrated in Florida. The manatee is apparently migratory. During the winter months manatees concentrate along the coast of peninsular Florida from the Crystal River (west coast) to Titusville (east coast) and from Jacksonville south in the St. John's River. During the summer months the population disperses along the coast.

Approximately 26 species of cetaceans occur in the Gulf of Mexico; six of these species are listed as endangered species: blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*), right whale (*Eubalaena glacialis*), sei whale (*Balaenoptera borealis*), and sperm whale (*Physeter catodon*). Recent aerial surveys have identified a sperm whale population off Texas which apparently moves into nearshore waters on a seasonal basis (Fritts, 1980, personal communication). Generally, most of these larger cetaceans occur in continental shelf, slope, or deep oceanic waters.

d. Marine Mammals

Twenty-seven species of marine mammals have been reported to occur in or migrate through the Gulf of Mexico. Those which occur in the Gulf of Mexico coastal zone are mainly three groups: the Florida manatee, small cetaceans (porpoise and dolphins), and occasionally large cetaceans. Information on the manatee and large cetaceans has been discussed in Section III.B.1.c.

Bottlenose dolphin (*Tursiops truncatus*) is the most common small cetacean which occurs in the Gulf coastal area. Surveys conducted in the Gulf of Mexico indicate a population of about 1,000-5,000 bottlenose dolphins offshore Texas (Orr, 1977) and about 1,700-7,600 offshore Louisiana (Leatherwood and Platter, 1975). Apparently, there are two groups of bottlenose dolphins—one that inhabits the coastal areas maintaining small discrete populations and an offshore population that congregates in larger numbers. It has been suggested that larger dolphins move offshore during the winter, whereas smaller dolphins are more common offshore during the summer.

No currently listed endangered/threatened plants are known to occur in the Gulf of Mexico coastal region.

Additional information on endangered/threatened species is contained in the FWS and NMFS Biological Opinions in Appendix E.

2. Shelf

a. General

West of the Mississippi River the shelf corresponds to the brown shrimp grounds of Chittenden and McEachran (1976). This area is characterized by nonestuarine-associated ichthyofauna and is dominated by the longspined porgy (*Stenotomus caprinus*). The shelf is reported to support a higher biomass than the nearshore white shrimp grounds.

In the eastern Gulf the De Soto Canyon has unique areas of high relief and reefal assemblages. Recently, three portions of the canyon were surveyed—the northern rim, 54-60 m in depth (Shipp and Hopkins, 1978); the western flank (68-375 m); and the eastern flank (72-115 m). Shipp and Hopkins (1978) observed limestone ledges bordered by sandy flats. Relief of the ridges increased to 10 m to the southwest. They reported that the ledges become discontinuous and many "spire-like" ledges of 10-15 m relief were evident on fathometer records. Tall pinnacles and irregularities occur on the eastern flank between 86-90 m. One pinnacle encountered rose 11 m above the seafloor. These outcrops were encrusted by sponges, sea fans, and sea whips; congregations of tropical reef fishes were also reported.

Farther to the southwest and in somewhat deeper water, a BLM-funded study, Final Report Contract AA551-CT8-22 (Woodward-Clyde Consultants, 1979), observed irregular reef-like features and pinnacles up to 9 m in relief; these occurred around 80-115 m. Coral (*Oculina*), sea whips, sponges, and reef fish concentrations were observed on both the northern rim and the western flank.

Pelagic nekton such as cephalopod molluscs, billfish, tunas, sharks, and mackerels range over the shelf. For a more detailed treatment of plankton, nekton, and benthos, see FEIS 65 and 58.

In the region of the shelf break, the central Gulf is characterized by a series of "topographic highs" which are geologic features rising out of 100-200 m to various depths and trending east-west along the break. Many of these are the surface expression of salt domes, and nearly all are hard, rocky outcrops; many are drowned coral reefs. The hard, more or less vertical surfaces provide habitat and food for a wide variety of organisms. It has been found, largely through BLM-funded studies, that at similar depths all of these banks contain similar biological communities. The East and West Flower Garden Banks off Texas and Louisiana rise closer to the water's surface than the others and are the only two which contain living coral reefs. For complete descriptions of these biologically important areas, see Bright and Pequegnat (1974) and Bright and Rezak (1976, 1978a, and 1978b). Two tracts are located close to the Flower Garden Banks (tracts 67-224 and 67-225). These and the tracts near the other five banks in this area which have tracts located near enough to them so that there is concern that oil and gas activities may cause harm to the biota of the banks will have stipulations applied to their leases to protect those biota (Section I.C.2.b.). These other banks are Applebaum Bank (tracts 67-39 and 67-40), Parker Banks (tracts 67-72, 67-73, and 67-74), Diaphus Bank (tract 67-96), Geyer Bank (tracts 67-151, 67-152, 67-153, and 67-154), and Fishnet Bank (tracts 69-78 and 69-79). A detailed description of Parker Banks may be found in Bright and Rezak (1978b). Applebaum, Diaphus, and Geyer Banks are treated in Texas A&M University (1981).

Because of their particular sensitivity and the interest shown in them (proposed marine sanctuary), the Flower Garden Banks are described herein in some detail.

The East Flower Garden Bank, west of tract 67-22, is unique in that it and West Flower Garden Bank are the only examples of extensive tropical Caribbean coral reef communities found in the northern Gulf. The following description of East Flower Garden Bank is taken from Bright and Rezak (1976).

Over 250 species of benthic invertebrates and more than 100 fishes inhabit the bank. Above 25-29 m the bank is covered with a thriving submerged coral reef which, except for its total lack of shallow-water alcyonarians, is a good example of the *Diploria-Monastrea-Porites* community so common on reefs in the Caribbean and southern Gulf.

In addition, the bank harbors sizable knolls occupied almost entirely by populations of the small branching coral *Madracis mirabilis* (*Madracis* Zone). Finger-sized remains of dead *Madracis* are extremely important components of the sediment on and adjacent to the reef. In some cases the coarse carbonate sand which typically occurs between coral heads in the *Diploria-Monastrea-Porites* Zone is entirely supplanted by *Madracis* rubble.

Other knolls at the bank are covered completely by lush growths of leafy algae *(Caulerpa, Chrysymenia, Halymenia, Lobophora, Microdictyon*, and others). The presence at the East Flower Garden of this Leafy Algae Zone, the *Madracis* Zone, and knolls of intermediate biotic composition (which bear various types of sponges, *Madracis* clumps, patches of leafy algae, and extensive encrustations of coralline algae) is indicative of a greater degree of lateral biotic variability on the 69-acre crest of this bank than has been observed at the West Flower Garden Bank.

Between 50-76 m, the bank is occupied by an Algal-Sponge Zone. The bottom in the Algal-Sponge Zone is covered primarily with nodules (up to fist size and larger) composed of encrustations of coralline algae, mostly *Lithophyllum* and *Lithohamnium*, with lesser amounts of the encrusting foraminifer *Gypsina plana*. The coralline algae are important and abundant in the *Diploria-Monastrea-Porites* Zone, as well as the Algal-Sponge Zone, and extends to depths exceeding 90 m decreasing in percent cover below 75 m or so.

In the lower reaches of the Algal-Sponge Zone the nodules give way to coralline algal crusts adhering to the hard carbonate substratum. Among and attached to the nodules of the Algal-Sponge Zone is a sizable population of leafy algae, generally the same organisms which occur in the Leafy Algae Zone at the bank. Sponges are very conspicuous, particularly the encrusting *Neofibularia nolitangere oxeata;* the tube sponge, *Callyspongia vaginalis;* and a branching sponge, *Verongia* sp. Other notably conspicuous invertebrates of this zone are small saucer-shaped growths of agariciid stony corals and a large anemone, *Condylactis* sp.

Certain expatriate reef fishes are moderately abundant within the Algal-Sponge Zone (viz: squirrelfishes, *Holocentrus* spp.; groupers, *Mycteroperca* spp.; Creolefish, *Paranthias furcifer;* Wrasse bass, *Liopropma eukrines;* Red snapper, *Lutjanus campechanus;* Verminion snapper, *Rhomoboplites;* Reef butterflyfish, *Chaetondon sedentarius;* Blue angelfish, *Holocanthus bermudensis;* Cherubfish, *Centropyge argi;* Yellowtail reeffish, *Chromis enchrysurus;* and Spotfin hogfish, *Bodianus pulchellus).*

The deepest hard-bank assemblage represented at the East Flower Garden Bank is the Antipatharian Zone. The Antpatharian Zone represents a transition downward from the shallow-water benthic biota to a truly deep-water assemblage. Missing from the Antipatharian Zone proper are any stony corals except sparse populations of the saucer-shaped agariciid, a small species of *Madracis*, and some solitary ahermatypic varieties. *Lithophyllum* occurs in reduced quantities, and leafy algae are sparse. Present are abundant populations of comatulid crinoids, and deepwater alcyonarian fans and whips, all of which are either absent from or rare above 76 m at the Flower Garden Banks. The most conspicuous organism in this zone is a bedspring-shaped, white antiparharian sea whip, *Cirripathes*. Although the depth range of the antipatharians extends upward almost to the coral reef, they are rarely seen shallower than 55 m.

Natural gas seeps have been observed at most of the major reefs and banks off Texas. These seeps are intermittent in nature and characteristically emit repeated short bursts of several to hundreds of bubbles, each generally less than one inch in diameter.

The chemical compositions of gases collected from various seeps suggest that some are of biogenic origin (microbial decomposition of organic matter in anoxic environments at temperatures below 50°C) and some are petrogenic (thermocatylitic processes acting on organic matter at higher temperatures). It is apparent that the gas seeps associated with shallow coral reefs at the East and West Flower Garden Banks are biogenic in nature, although deeper seeps at the East Flower Garden Bank may be partly or wholly petrogenic. Whatever their origin, the gases from these seeps have been found to consist of 98.5%-99.99% methane with traces of ethane and propane.

There is no evidence that such seeps have had any large scale effects on benthic populations. A possible instance of very localized effects of biogenic gas seeps on coral "health" was recently detected at the West Flower Garden Bank at a depth of 25 m. A *Monastrea annularis* head around which gas was intermittently bubbling ranged in color from brown to mustard yellow and was plagued with ulcer-like dead patches covered with or ringed by growths of filamentous algae. However, insofar as such conditions are common at the Flower Garden Banks, there may be little or no connection between the gas seep and the poor condition of the coral. Speculation that fishes are attracted to gas seeps has not been confirmed by our observations. The fish are nearly always inclined to position themselves over or beside coral heads, rocks, outcrops, or bottom irregularities. Where they occur, the gas seeps are frequently associated with these features. However, fishes congregating nearby seem to be oblivious of the gas, showing no behavior which would indicate an affinity for it.

A quarter hectare or so brine pool was discovered in 1976 in a depression on the East Flower Garden Bank at 72 m. Apparently seeping from a diapiric structure underlying the bank (salt domes are common off Texas and Louisiana, accounting for many of the topographical features found there), the 188 parts per thousand (ppt) brine flows over the margin of the pool down the axis of a canyon cut into the bank's hard carbonate substratum and out onto surrounding level, sandy bottom at 80 m. By the time the brine has traveled this far, it has become diluted to 39.6 ppt due to turbulent flow and mixing in the axis of the canyon. This is evidence that the sustained flow of dense water through the 7-15 m deep canyon contributes locally to sediment transport and erosional processes resulting in movement of sand-to-cobble-sized particles off the hard-bank and possible disintegration and dissolution of the old reef, which seemingly at this depth is a coralline algal bioherm.

Filamentous and leafy algae are associated with the East Flower Garden Bank's brine. A significant bacterial population on the bottom of the brine pool is indicated by large vivid patches of purple on the sediment surface.

In spite of its rather potent nature, the brine does not appear to have affected epibenthic populations outside of a ring extending a meter or so above the interface between the brine and overlying average marine water. Fishes were not observed to enter the highly saline brine in the pool, but groupers (*mycteroperca*, spp.) and Cottonwick (*Haemulon melanurum)* swam freely in and out of the mixing brine stream within the canyon.

The West Flower Garden Bank, to the southwest of tract 67-225, is quite similar to the East Flower Garden Bank, although it apparently lacks some of the shallower biotic zones found at the East Flower Garden Bank above 45 m, namely, the Leafy Algae Zone and *Madracis* Zone.

Water clarity on the bank is exceptional, with visibility consistently exceeding 15 m and often 30 m. The main living coral reef (*Diploria-Porites* Zone) occupies the crest of the bank down to approximately 46 m depth.

Living corals cover 30%-50% of the bottom where the reef is developed, and the major reef builders are *Montastrea, Diploria*, and *Porites*, probably in that order of importance. The fire coral, *Millepora alcicornis*, encrusts reefrock throughout the zone as do various species of sponges and other epifauna.

In the western Gulf (from south of Freeport where the break turns to the south) such deep and clear-water features are not found; rather, a series of low relief banks rising only on the order of 10-20 m in 60-80 m water depth are located further up the shelf. Compared to the banks of the central Gulf, these banks have depauperate flora and fauna (Bright and Rezak, 1978a). More sediments are found on the banks, and the water is generally more turbid than that found at the central Gulf banks. These banks, while important biologically, are not nearly so rich and diverse as those of the central Gulf. Southern Bank (tracts 67-13, 67-14, 69-18, 69-19, and 69-20) is the only bank in this category which has proposed lease tracts on or near it. Southern Bank is described in Bright and Rezak (1976 and 1978a).

The stipulations described in Section I.C.2.b. will provide protection for the biota of these topographic features from the potential impact of nearby oil and gas operations.

Unfortunately, much less is known about the seafloor features of the eastern Gulf, but it is known that the Florida shelf has extensive "hard bottom" areas which may be "live bottom" areas if water conditions and depth permit the growth of rich biological communities. Live bottoms are defined as those areas which contain biological assemblages consisting of such sessile invertebrates as sea fans, sea whips, hydroids, anemones, ascidians, sponges, bryozoans, or corals living upon and attached to naturally occurring hard or rocky formations with rough, broken, or smooth topography or whose lithotope favors the accumulation of turtles and fishes.

The available evidence indicates that these areas are sparsely scattered in small patches throughout the shelf of the eastern Gulf (Bright and Jaep, 1976). The Florida Middle Grounds are probably the best known and most biologically developed of these areas with extensive inhabitation by hermatypic corals and related communities; however, none of the proposed tracts are in the vicinity of the Florida Middle Grounds. In general, since species diversity and biomass decrease with increasing depth, it is believed that unique and productive live bottom areas requiring protection from potential adverse impacts from oil and gas operations will not be found at depths greater than 100 m. Therefore, the stipulation designed to protect live bottom areas will apply to tracts on the Florida shelf in less than 100 m of water. It should be noted that a study in progress on the west Florida shelf (contract no. AA851-CT0-50, Southwest Florida Shelf Ecosystems Study) may develop information which will require modification of either the stipulation or its application; such modification, if necessary, will be carried out with the advice and consultation of FWS, USGS, and the state of Florida. The stipulation being considered at present is described in Section I.C.2.b. Sixty-nine tracts in proposed Sale 67 and 38 tracts in proposed Sale 69 will be affected by this stipulation. These tracts are:

67-106 through 67-126
67-176 through 67-223
69-121 through 69-125
69-128 through 69-131
69-191 through 69-197
69-200
69-203
69-206
69-207
69-210
69-211
69-214
69-215
69-218
69-219
69-222
69-223
69-226
69-227
69-230
69-231
69-234
69-235
69-238
69-239
69-243
69-247

b. Marine Birds

Several species of marine birds, such as boobies, petrels, shearwaters, etc., occur in the Gulf of Mexico continental shelf region (see bird list in FEIS 65, Table II-10). Marine birds primarily feed and roost offshore, coming onshore for nesting or when storms blow them inshore. Generally, the largest concentrations of marine birds are found in upwelling areas (near the continental slope edge) and areas of high productivity. Because of their marine habits, population and distribution data for marine birds are limited.

c. Endangered and Threatened Species

Primarily, the only known endangered species which occur in the Gulf continental shelf region are the larger cetaceans which are discussed in Section III.B.1.c.

d. Marine Mammals

Generally, two groups of marine mammals occur on the Gulf continental shelf—small and large cetaceans. Striped dolphins (*Stenella caeruleoalba*), spotted dolphins (*Stenella plagiodon*), and spinner dolphins (*Stenella longirostris*) are examples of smaller cetaceans which occur in the Gulf continental shelf region. The large cetaceans are discussed in Section III.B.1.c.

3. Slope and Deep Oceanic Habitat

a. General

This discussion of slope biota is taken largely from the BLM-funded study, "Ecological Aspects of the Upper Continental Slope of the Gulf of Mexico" (Pequegnat et al., 1976).

The slope is a transitional environment influenced by processes on the shelf and the abyssal Gulf. This transition applies more to the pelagic than to the benthic realm. The lower boundary of the euphotic zone is about 50-60 m; thus, the entire slope is in darkness. The lower limit of light penetration, 50-60 m, may be taken as the lower depth limit of photosynthetic activity of phytoplankton.

The general conclusions which may be reached are as follow: (1) the shelf phyto- and zooplankton are more abundant, more productive, and seasonally more variable than the open Gulf plankton; (2) in these respects, the slope plankton is intermediate but closer to the condition of the open Gulf; and (3) each of the three regions is characterized by some species which are more or less specific to the particular zones. Some east-west differences have been noted, especially among the diatom species. These have also been interpreted as representing the differences between normal Gulf waters and those influenced by Mississippi River water.

The planktonic biota of the surface waters may be viewed as pri[illegible]tional between that of the shelf and that of the deep Gulf; such is not the case with the benthic fauna. Most of the benthic inhabitants of the slope are not found elsewhere, and together they constitute a complex, abundant true slope fauna.

Oil and gas industry interest in the resources of the Gulf continental slope is becoming evident indeed, some 51 tracts in proposed Sale 67 and 35 tracts in proposed Sale 69 may be considered to be on the slope (in waters deeper than 200 m). With the exception of Geyer Bank, which may be considered either a shelf-break or slope feature (and is treated in Section II.B.2.), no biologically sensitive areas of the slope are near any of the tracts of these proposed sales.

No tracts in this proposal are in the deep oceanic area. Because of this, the possibility of impact appears low. One could speculate that an oil spill could become entrained in the Loop Current and transported to this deep oceanic area either by drifting with the current or as the current itself migrates southward in the winter; however, these possibilities are very remote.

A follow-up study presently being conducted by Dr. Pequegnat consists of analysis of previously collected but unworked samples from the continental slope and rise, generally between Brownsville, Texas, and the DeSoto Canyon. Additional samples from the abyssal plain of the northern Gulf (north of the 25th parallel) and from the western Gulf shelf, slope, and abyssal plain as far south as the Gulf of Campeche will also be analyzed and discussed. The study effort includes a description of the community structure of these deep Gulf communities, descriptions of the populations and species at the various stations, distribution maps of the dominant species, and discussion of chemical, geological, and hydrographic data available, as well as an assessment of potential impacts of oil and gas exploration and production on deep communities. The final report is scheduled for completion by the fall of 1982.

b. Marine Birds

Marine birds occur in the Gulf slope and deep oceanic regions and have been discussed in Section III.B.2.b.

c. Endangered and Threatened Species

The only known endangered species which occur in the Gulf slope and deep oceanic regions are large cetaceans which are discussed in Section III.B.1.c.

d. Marine Mammals

The marine mammals which occur in the Gulf slope and deep oceanic regions are small and large cetaceans. Short-finned pilot whales (*Globicephala macrorhynchus*), Risso's dolphin (*Grampus griseus*), false killer whales (*Pseudora crassidens*), pygmy sperm whales (*Kogia breviceps*), goose-beaked whales (*Ziphius cavirostris*), and Antillean beaked whales (*Mesoplodon europaeus*) are examples of small cetaceans which occur in the Gulf slope and deep oceanic regions. The large cetaceans are discussed in Section III.B.1.c.

C. Selected Socioeconomic Characteristics

1. Economic Conditions and Trends

For the purpose of this analysis, the socioeconomic impact area comprises the following 74 counties and parishes:

Alabama - Baldwin and Mobile
Florida - Bay, Charlotte, Citrus, Collier, DeSoto, Dixie, Escambia, Franklin, Gulf, Hernando, Hillsborough, Holmes, Jefferson, Lee, Levy, Manatee, Monroe, Okaloosa, Pasco, Pinellas, Santa Rosa, Sarasota, Taylor, Wakulla, and Walton
Louisiana - Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Landry, St. Martin, St. Mary, St. Tammany, Tangipahoa, Terrebonne, Vermilion, and West Baton Rouge
Mississippi - Hancock, Harrison, and Jackson
Texas - Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jackson, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Orange, Refugio, San Patricio, Victoria, Wharton, and Willacy

This area, hereafter referred to as the coastal or Gulf region, is one of varied socioeconomic patterns ranging from low-density, rural undeveloped sections to high-density, urban highly-developed centers. Major urban areas occur throughout the region and include in east to west order: Ft. Myers, St. Petersburg, Tampa, and Pensacola, Florida; Mobile, Alabama; Pascagoula and Gulfport, Mississippi; New Orleans, Baton Rouge, Lafayette, and Lake Charles, Louisiana; and Galveston, Houston, Corpus Christi, and Brownsville, Texas. The degree of urbanization and the population density in these areas vary considerably. Orleans Parish, Louisiana, possessed the highest urban population percentage (99.7%) and total population density (2,895 people per square mile) in 1970 according to data from the U.S. Department of Commerce, Bureau of the Census (USDC, BC, 1972).

Much of the economic activity within the area is dependent upon its abundance of natural resources. The production of oil and gas is a significant primary industry, as well as the support for numerous secondary activities such as petroleum and petrochemical development. Commercial fishing is a major occupation throughout the area; recreation and tourism are also important, particularly on the Florida Gulf coast. Major transportation systems, such as the Mississippi River, are the basis for port activity which is significant to the well-being of local, regional, and national economies. A more detailed explanation and summary of these dominant socioeconomic characteristics of the Gulf of Mexico coastal region follow. Data for each state represent only those counties or parishes within the study area.

a. Employment

The following data show historic indicators of labor force and unemployment for the Gulf region.

LABOR FORCE DATA

Item	Alabama	Florida	Louisiana	Mississippi	Texas	Gulf Region
1970						
Civilian Labor Force	133,804	506,677	808,774	75,993	1,185,991	2,711,239
Total Unemployed	7,144	19,168	41,524	3,382	41,472	112,690
Unemployment Rate (%)	5.3	3.8	5.1	4.4	3.5	4.2
1979						
Civilian Labor Force	180,295	1,117,423	1,147,540	104,510	1,825,773	4,375,541
Total Unemployed	14,536	62,932	72,225	6,570	74,139	230,402
Unemployment Rate (%)	8.1	5.6	6.3	6.3	4.1	5.3

Source: Alabama Department of Industrial Relations, unpublished data.
Florida Department of Labor and Employment Security, unpublished data.
Louisiana Department of Labor, unpublished data.
Mississippi Employment Security Commission, unpublished data.
Texas Employment Commission, unpublished data.
USDC, Bureau of the Census, County and City Data Book, 1977.

In 1970 the Gulf region unemployment rate (4.2%) was slightly lower than that of the U.S. (4.4%). While both the civilian labor force and unemployment have significantly grown within the Gulf region since that time, the study area has generally remained below the national level in percent unemployed. The major employment sectors vary in rank for each state, but they are from these four sectors: manufacturing, wholesale/retail trade, services, and government. Employment is further explained in the FEIS's for Sales 65, 51, 58, and 58A.

b. Income

While the per capita personal income level for the Gulf region was below the comparable U.S. level in both 1970 and 1978, its proportion of the U.S. figure grew from 91.5% to 98.2% over these years. Such growth has contributed significantly to the population patterns within the study area:

PERSONAL INCOME DATA

Item	Alabama	Florida	Louisiana	Mississippi	Texas	Gulf Region
1970						
Total Personal Income ($1000)	$ 1,121,428	$ 7,269,400	$ 7,607,200	$ 779,900	$ 11,593,769	$ 28,371,697
Per Capita Personal Income	$ 2,971	$ 3,463	$ 3,399	$ 3,251	$ 3,863	$ 3,566
1978						
Total Personal Income ($1000)	$ 2,752,383	$ 19,219,497	$ 18,809,040	$ 1,723,554	$ 31,551,010	$ 74,055,484
Per Capita Personal Income	$ 6,320	$ 7,060	$ 7,280	$ 6,050	$ 8,790	$ 7,700
1970-78						
% Change in Total Personal Income	145.4%	164.4%	147.3%	121.0%	172.1%	161.0%
% Change in Per Capita Personal Income	112.7%	103.9%	114.2%	86.1%	127.5%	115.9%

Source: USDC, Bureau of Economic Analysis, Local Area Personal Income 1970-1975 and 1973-1978.

c. Population

The population growth of the Gulf region has been directly related to the general economic conditions within the area. The area has experienced significant growth in certain industrial and commercial activities resulting in population trends as indicated below:

POPULATION DATA

Total Population 1960-78

			% Change		% Change	Net Migrations 1970-1978	
Area	1960	1970	1960-1970	1978	1970-1978	Number	Rate*
Alabama	363,389	376,690	3.7	435,400	15.6	26,500	+ 7.0%
Florida	1,535,690	2,076,204	35.2	2,721,100	31.1	619,600	+29.8%
Louisiana	1,831,758	2,237,989	22.2	2,583,900	15.5	77,300	+ 3.5%
Mississippi	189,050	239,944	26.9	285,100	18.8	15.600	+ 6.5%
Texas	2,403,817	2,991,621	24.5	3,589,500	2.0	277,300	+ 9.3%
Gulf Region	6,323,704	7,922,448	25.3	9,615,000	21.4	1,016,300	+12.8%
U.S.	179,323,000	203,212,000	13.3	218,500,000	7.5		

* Net Migration Rate is expressed as a percent of the 1970 total population for each area. Such data for the U.S. as a whole is not applicable to this analysis.

Source: USDI, BLM, 1974. Environmental and Socioeconomic Baseline on the Gulf of Mexico Coastal Zone and Outer Continental Shelf.
USDC, BC, 1980. Current Population Reports, Series P-25, No. 873.

Total population in the Gulf region has grown at a compound annual rate of 2.0% over the 1970-1978 period in comparison to 0.9% for the entire U.S. Furthermore, the study area experienced net in-migration of 12.8% over the 1970-1978 period, over 60% of which was into the Florida portion of the Gulf region.

2. Land Use

a. General Characteristics

The Gulf of Mexico coastal region which might be affected by the proposed lease sales extends from the mouth of the Rio Grande at the U.S./Mexico border to the Florida Gulf coast south of Estero Island just north of Naples. Much of the coastal area is marked by barrier island formations similar to the Atlantic shoreline; there is also the vast delta formation of the Mississippi River.

The Texas Gulf coast area is characterized by a nearly continuous chain of barrier islands and beach separated from the heavily indented mainland coastline by an extensive series of inland bays. The principal rivers flowing into the bays along the Texas coast are the Nueces, San Antonio, Lavaca, Colorado, San Jacinto, Trinity, and the Sabine along the Texas/Louisiana line. The Gulf shore of these barrier islands is composed mostly of sandy beaches. Of the total state shoreline of about 2,500 miles, approximately 380 miles are sandy beach. The vast bay/estuary zone contains areas of marsh and wetland similar to that found along the Atlantic coast as generally described in the 1970 National Atlas of the U.S.

The Louisiana Gulf coast area is characterized by vast areas of salt marsh lying at or near sea level, either partially submerged or subject to tidal inundation, and pocketed with shallow lakes, bayous, sounds, and bays. The entire area, interlaced with a network of channels and canals, occupies about 3.7 million acres in a broad band across most of the state's interface with the Gulf. This band is from 20-30 miles wide in the western portion of the state's coast. The eastern portion of the Louisiana coast is dominated by the Mississippi River delta which has a frontage over 150 miles along the Gulf and extends a similar distance inland from the present river mouth. Because of the coastal configuration, there is a general lack of extensive areas of sandy beach; however, throughout the entire coastal area of the state there are many difficult access pockets of beach totaling approximately 835 miles of the overall 1,943 mile state shoreline. Salt marsh vegetation, belts of wooded swamp, and strips of natural levees are the major characteristics of the area.

The Mississippi Gulf coast area consists mostly of marsh areas and artificially maintained beaches; only on the eastern portion of the state's Gulf shore do narrow marginal natural beaches dot the coastline. The small sandy offshore barrier islands off the actual coastline of the Gulf are separated from the mainland by the

Mississippi Sound. All, except Cat Island, have beaches on both the Gulf of Mexico and Mississippi Sound shorelines with marsh in the central portion. The Gulf shoreline of these islands totals about 33 miles which includes 27 miles of beach. The mainland contains two landlocked bays, Back Bay of Biloxi and St. Louis Bay, as well as the Pascagoula River estuary. The total non-Gulf shoreline of the state's coast is 214 miles in length which includes about 70 miles of beach.

The Alabama Gulf coast area varies from sandy coastal beaches to tidal marshes in the two counties bordering the Gulf. It is dominated by Mobile Bay which is almost entirely enclosed by barrier islands. The total Gulf shoreline of the barrier islands is all beach and is 46 miles in length. Behind these islands are shorelines of mixed marsh and beach; of the 306 miles of bay/sound shoreline of Alabama, the remaining is marsh and wetlands.

The Florida Panhandle Gulf coast area extends from the Florida/Alabama line eastward to the Ochlockonee Bay which is located at the west end of Apalachee Bay. This area is characterized by wide sandy beaches and barrier islands backed by dunes. Most of the beach material along this reach is white sand composed primarily of quartz. Of the total 1,063 miles of shoreline within this area, 219 miles is ocean/Gulf beach that is all sand, and 551 miles is bay/estuary beach. The remaining 293 miles of shoreline consists of marsh.

The upper Florida Gulf coast area extends from Apalachee Bay southward to Anclote Key. This reach is unique in that it is almost devoid of barrier beaches and semienclosed bays, consisting almost entirely of low, flat salt marshes and mud flats that penetrate inland several miles. Further inland are fresh marshes and swamps. Mangroves exist nearer the southern portion of the area along the coastline of Hernando and Citrus Counties. This section of coast, particularly in Apalachee Bay, is essentially free of wave energy that moves littoral materials along coastlines. Sandy beaches are uncommon and, where present, are thin and poorly developed. Less than 5 miles of the 276 mile shoreline within this entire area is classified as natural beach.

The mid-Florida Gulf coast area extends from Anclote Key southward to Naples. This area consists of barrier islands separated from the mainland by generally shallow tidal lagoons or inlets and from each other by shallow natural passes. The 142 miles of shoreline fronting the Gulf along this area, which includes the urban concentrations surrounding Tampa, St. Petersburg, Sarasota, and Fort Meyers, consist of natural beaches composed of fine white sand that contains a considerable amount of shell. The land along the shoreline of nearly all the mainland coastline and the mainland side of the barrier islands within this area, approximately 1,230 miles, is low and marshy.

The listing below indicates the total beach shoreline in miles for the five states discussed in this section.

BEACH SHORELINE IN THE GULF OF MEXICO REGION

Gulf Coast Area	Beach (Miles)	Total Shoreline (Miles)	Percent Beach
Texas	380	2,500	15.2
Louisiana	835	1,943	43.0
Mississippi	97	247	39.3
Alabama	249	352	70.7
Florida Panhandle	770	1,063	72.4
Upper Florida	5	276	1.8
Mid-Florida	157	1,375	11.4

Source: USDI, BLM, 1975.

b. Shoreline Land Ownership

Shoreline ownership of the Gulf coast area is predominantly private, as indicated below. Ownership by the federal government is extremely limited in the mid-Florida, Mississippi, and Alabama areas; however, greater concentrations are located in the Florida Panhandle (military-oriented: Pensacola Naval Air Station, Eglin and Tyndall AFB's). Louisiana Gulf coast (wildlife conservation-oriented), and Texas Gulf coast (recreation/wildlife conservation-oriented) areas. Nonfederal public (state/local) ownership is greatest in the Louisiana shoreline reaches where the state owns several wildlife conservation management areas.

LAND OWNERSHIP OF THE GULF OF MEXICO REGION SHORELINE

Gulf Coast Areas	Total Length Of Shoreline (Miles)	Federal (Miles)	Federal (%)	State/Local (Miles)	State/Local (%)	Private (Miles)	Private (%)
Texas	2,500	390	15.6	50	2.0	2,060	82.4
Louisiana	1,943	245	12.6	332	17.1	1,366	70.3
Mississippi	247	33	13.4	43	17.4	171	69.2
Alabama	352	2	0.6	13	3.7	337	95.7
Florida Panhandle	1,063	221	20.8	107	10.1	735	69.1
Upper Florida	276	44	15.9	26	9.5	206	74.6
Mid-Florida	1,375	27	2.0	36	2.6	1,312	95.4

Source: USDI, BLM, 1975.

c. Coastal Land Use

The coastal area of the Gulf of Mexico is characterized by a natural pattern of barrier islands, bays and other estuaries, wetlands (swamp and marsh), and uplands as previously described. Interspersed within, and in some cases superimposed on this natural pattern of undeveloped open space, is the human environment consisting of uses and activity systems such as agricultural areas; metropolitan and urban areas; transportation, utilities, and communication systems; parks and recreational areas; mineral extraction; business and industrial activities; residential and institutional activities; and forest, wildlife, and aquatic conservation areas. Agricultural and undeveloped open space uses (e.g., parks and recreation areas; forest, wildlife, and aquatic conservation areas) are the predominant land and water uses along the coast in terms of area and length of shoreline. But it is the metropolitan and urban areas, the centers of industrial, business, and government activities, which dominate the region from an economic and social standpoint. About three-fourths of the Gulf coast's total population reside within the urban areas. Most business, industrial, public, and semipublic uses are located in the region's urban areas and small towns. However, there is considerable business and nonfarm residential development scattered throughout the region on its roads and highways. Agricultural land use is important in several sections of the Gulf coast, particularly in Texas where extensive areas of cropland with pasture and grazing and range and ranch land is found. Numerous recreation and conservation areas and historic sites are also located in the coastal regions. A more detailed description of coastal zone land use for each Gulf coast state is presented in the following paragraphs.

The land use along the Texas Gulf coast is variable in type and intensity on both the mainland and barrier islands. Over 70% of the total shoreline is undeveloped as indicated below; however, the areas of developed shoreline vary from recreation-oriented, resort/vacation cottage, or marina facilities to the intensely developed urban industrial-commercial land uses.

SHORELINE USE IN THE GULF OF MEXICO REGION

Gulf Coast Area	Public Recreation (Miles)	Private Recreation (Miles)	Non-Recreation Development (Miles)	Undeveloped (Miles)	Total Miles
Texas	406	162	112	1,820	2,500
Louisiana	21	32	50	1,840	1,943
Mississippi	31	106	9	101	247
Alabama	32	210	5	105	352
Florida Panhandle	99	521	166	277	1,063
Upper Florida	3	12	33	228	276
Mid-Florida	45	81	320	929	1,375

Source: USDI, BLM, 1975.

The land use on the barrier formations is generally a function of proximity to population centers and availability of access. The beaches facing the Gulf are generally suitable for recreation-oriented activities. Padre Island, which stretches from the U.S./Mexico border north to near Corpus Christi Bay, is now a national seashore and retains its natural conditions except for recreation facilities at its north end. Some areas to the north and south, however, are being rapidly developed for residential and commercial uses or are under similar development pressures. Mustang Island is also a highly developed recreation center for the Corpus Christi metropolitan area with beach homes, resorts, water-oriented recreation facilities, and commercial establishments. Galveston Island and Bolivar Peninsula contain the Galveston urban area, and both are highly developed. The Galveston Bay area, consisting of commercial and residential uses and large industrial complexes which relate to fishing, shipping, and offshore oil and gas exploration and production, contains the largest concentration of shoreline development on the entire Texas coast. The largest port facilities of the entire Gulf coast region are located here. The other significantly developed area is Corpus Christi.

The Louisiana Gulf coast is largely undeveloped along the shoreline with more intensive land uses concentrated in those inland areas more suitable for development. The vast, broad areas of coastal marsh preclude beach-oriented activities in most areas due to the general lack of sandy beaches and the lack of access to shoreline areas. Existing land use consists of small communities oriented to the seafood industry and supportive of offshore oil and gas operations. Severe development constraints, including susceptibility of hurricane surges, have kept permanent shoreline developments to a minimum. Industry in the coastal zone is dominated by petroleum refining, petrochemical production, ship building, food processing (including seafood), and primary metals, with petroleum refining and petrochemicals being the most significant. Activities relating to the extraction, transportation, and processing of oil and gas (including the offshore component) are significant land uses in the coastal zone. The majority of oil and gas wells are in swamp and marsh areas, and most of the state's total production comes from the coastal zone parishes. Agriculture, primarily rice and sugar cane production, is also a significant activity in the coastal zone.

The Mississippi Gulf coast land use is marked by a diversity of a generally highly developed mainland shoreline on the Mississippi Sound and a generally undeveloped shoreline on the barrier islands facing the Gulf. Part of these islands are now within the Gulf Islands National Seashore. Very little differentiation remains between communities along the coastline where a high-density urban corridor has recently taken form due partly to great expansion of the tourist-recreation industry. The only major breaks in this linear development are the natural features such as bays, estuaries, rivers, and tidal marshes.

On the Alabama Gulf coast, topography has imposed historical constraints on development patterns and land use allocations. Mobile Bay and its delta to the north, as well as other low elevation areas subject to flooding, are generally timbered and undeveloped while development has been directed to higher elevations along the coast and inland. The coastal areas, especially the barrier islands, are coming under increased pressure for commercial and recreational development. Many smaller communities exist which consist of residential areas, cottages, hotels, and motels accommodating tourists and seasonal visitors. Some of these barrier islands are included in the Gulf Islands National Seashore, however, and will retain their natural conditions.

The Florida Panhandle Gulf coast area land use is in part a function of the physical differences of the barrier islands and the mainland bay areas. Shoreline uses are highly variable. The barrier islands are generally suitable for beach recreation-oriented activity, and considerable portions are used for recreation purposes. In recent years land use dedicated to the tourist and recreation industry has greatly increased. The area's development, however, is also focused on its mainland shoreline with naval activities, shipping, and marine resources predominating. Industrial development has also gravitated to the area because of available transportation and production facilities. The Pensacola Bay area contains a long, uninterrupted stretch of urbanized, industrialized shoreline. The most intense tourism and recreation-related land use is on the Gulf coast west of Panama City where an almost unbroken commercial strip development consisting of motels, condominiums, restaurants, summer homes, etc., has occurred. East of Panama City, however, the quality of the beach deteriorates; coastal land use becomes much less intense; populations are lower; and only a few summer homes exist.

Upper Florida Gulf coast land use is extremely extensive in character. Population densities are among the lowest in the state, and most of the area is commercial forest land or wetland. Very little use is made of the shoreline largely due to its inaccessibility. Several conservation-wildlife management areas are located in this area and will be discussed later in this section. Residential and commercial development is limited to the few towns and communities located throughout the area. Industry is related to forestry, lumbering, agriculture, and fishing.

The Mid-Florida Gulf coast area again finds the occurrence of urban development and beach-oriented commercial and recreation activities mixed with pockets of undeveloped shoreline. The major urban area in this stretch are the Tampa-St. Petersburg-Clearwater metropolitan complex with a population of over 1.5 million and the Sarasota-Bradenton area. Industrial expansion has occurred due to the transportation advantages of this coastal zone which has reinforced the historic shoreline-oriented development pattern. Presently, 82% of this region's developed land is in its coastal zone. Other stretches of the Gulf and bay shoreline throughout this area are developed for residential, resort, and tourist accommodation purposes. There are many apartments, motels, and concession facilities catering to tourists and beach visitors. Several of the undeveloped natural areas have been reserved as federal and state conservation-wildlife management areas.

3. Oil and Gas Industry

The infrastructure for oil and gas production in the western Gulf is the most developed in the world. It includes oil refineries, petrochemical and gas processing plants, supply bases for offshore services, platform construction yards, pipeline yards, and other industry-related installations. Although this development is mostly evident in offshore Louisiana, it also stretches to the west along the coast of Texas, but thins out along its southern coast.

In the eastern Gulf area, the infrastructure stretches as far as Pascagoula, Mississippi. Most areas in the eastern Gulf remain largely undeveloped in terms of OCS development or infrastructure due to the lack of economically recoverable hydrocarbon discoveries to date. For a further discussion see the FEIS for Sale 65. In addition, the Description of the Environment sections of the FEIS's for Sales 51 and 58A contain extensive information on the oil and gas industry in the Gulf.

The annual "Outer Continental Shelf Statistics" published by USGS, Conservation Division, Reston, Virginia, is a comprehensive source of OCS exploration, leasing, development, production, and revenue data. The most recent publication date is June 1980. A brief summary is given below:

GULF OF MEXICO OCS ACTIVITIES SUMMARY
(1954-1979)

	Louisiana	Texas	MAFLA[1]	Total
Exploration Permits				
1963-1969	1,417	673	188	2,278
1970-1979	2,075	926	277	3,276
Leases				
Number	2,086	768	143	2,997
Acreage	9,119,994	3,862,897	822,601	13,805,492
Well Status				
Total Wells	15,288	1,684	159	17,131
Wells Completed	7,710	460	41	8,211
Plugged/Abandoned	6,305	896	118	7,319
Active/Shut-in	7,142	378	65	7,585
Production/Value				
Oil & Condensate (10^6 bbls)	4,924.0	27.4	0	4,951.4
Gas (10^6 mcf)	41,802.5	2,141.0	0	43,943.5
Gasoline & LPG (10^6 gal)	14,474.5	450.3	0	14,924.8
Production Value (10^6 $)	$ 47,312.1	$ 1,684.7	0	$ 48,996.8
Royalty Value (10^6 $)	$ 7,678.5	$ 278.4	0	$ 7,956.9

[1] Mississippi, Alabama, Florida

Source: USDI, GS, June 1980, OCS Statistics.

As shown above, OCS oil and gas production, particularly in Louisiana, has contributed greatly to the study area's economy since 1954. However, it should be indicated that while the annual production value of oil and condensate has shown a virtually continuous increase since 1954, the quantity of such production has steadily declined since 1972. Contrarily, annual gas production within the study area has steadily increased since 1954.

4. Port Facilities

Most of the goods transported in the Gulf move by water or pipeline. Much of it moves by barge along the Gulf Intracoastal Waterway and up and down the many rivers in the Gulf states. Grain and other products of the Mississippi basin travel downriver to the Gulf while foreign goods and products from other parts of the U.S. are carried upriver and along the coast.

Commercial shipping ports along the Gulf coast include some of the busiest in the nation, particularly Houston and New Orleans. The extent of this activity is indicated in Table III-1.

Table III-1

Port Activity
(May 1980 - Cumulative to Date)

Area (U.S. Customs District*)	Total Exports (10^6 $)	Total Imports (10^6 $)
Mobile, Alabama	1,084.6	1,293.7
Tampa, Florida	1,004.3	1,585.9
New Orleans, Louisiana	7,947.6	9,466.6
Galveston, Texas	1,684.7	4,454.6
Houston, Texas	5,227.9	4,300.6
Port Arthur, Texas	820.5	4,280.7

*Ports of Entry included in each U.S. Customs District include: Mobile District — Gulfport, Pascagoula, Mobile, Pensacola, Panama City, Port St. Joe, Appalachicola, and Carrabelle; Tampa District — Tampa, St. Petersburg, Boca Grande; New Orleans District — New Orleans, Baton Rouge, and Morgan City; Port Arthur District — Port Arthur, Beaumont, Orange, and Lake Charles; Galveston District — Galveston, Freeport, Port Lavaca-Point Comfort, and Corpus Christi; and Houston District — Houston.

Source: USDC, May 1980, Highlights of U.S. Export and Import Trade.

New Orleans leads the nation in grain exports while Houston ranks first for its exports of chemicals and allied products. In regard to imports, these ports are by far the leaders in the receipt of petroleum products, primarily crude oil. Many smaller ports handle the large commercial fishing and recreational fleet of the Gulf of Mexico.

Shipping

Gulf shipping is both intracoastal and international with barges and supertankers competing for harbor and river space. Ships carrying midwestern grain pass tankers loaded with mideastern crude. In the open Gulf ships have to compete with barges, fishing vessels, oil and gas platforms, supply boats, and recreational vessels. Accidents are rather rare, however, since safety fairways are well-known. For a further discussion see the FEIS's for Sales 65, 51, and 58A.

5. Commercial Fisheries

Fisheries resources support a significant amount of commercial activity within the study area. In 1979 commercial fish landings in the Gulf states were 2.1 billion pounds with an ex-vessel value of $530.1 million. These figures represented 34.0% and 23.7% of comparable U.S. pounds and value of landings, respectively. The major species within the Gulf region include shrimp, menhaden, oysters, and blue hard crabs in order of value for the 1979 catch. Table III-2 illustrates the extent of study area activity.

Table III-2

Commercial Fish Landings

Species	Gulf		U.S.	
	1979	Average 1974-78	1979	Average 1974-78
Shrimp				
Pounds (10^6)	206.6	216.1	336.0	405.3
Value (10^6 $)	377.6	241.5	471.6	287.0
Menhaden				
Pounds (10^6)	1,718.2	1,305.1	2,604.5	2,046.9
Value (10^6 $)	73.4	49.0	109.4	69.9
Oysters				
Pounds (10^6)	15.3	17.1	48.1	51.0
Value (10^6 $)	20.8	15.7	65.6	49.3
Blue Hard Crabs				
Pounds (10^6)	38.2	39.1	152.8	133.3
Value (10^6 $)	8.0	6.7	31.4	23.5
All Species				
Pounds (10^6)	2,128.9	1,788.5	6,267.2	5,278.6
Value (10^6 $)	530.1	355.6	471.6	287.0

Source: USDC, NMFS, Fisheries of the United States 1974, 1975, 1976, 1977, 1978, and 1979.

While the value of the Gulf commercial fishing catch has steadily risen over recent years, the quantity of most species caught has generally declined. An important exception to this pattern, however, has been the catch of menhaden which recorded a record volume of 1.8 billion pounds in the Gulf in 1978 with only a slight decline in 1979. Virtually all of the menhaden landings were reduced to meal, oil, and solubles.

The breakdown of commercial fish landings in 1979 by state is shown in Table III-3.

Table III-3

Total Commercial Fish Landings in 1979

State	Pounds (10^6)	Value (\$$10^6$)
Alabama	33.3	50.0
Florida Gulf	108.5	90.8
Louisiana	1,529.1	198.5
Mississippi	383.6	33.3
Texas	84.9	160.2
Total Gulf Region*	2,139.4	532.8

*Gulf totals provided herein differ slightly from the data shown in Table III-2 since the latter information was preliminary to the data available for individual states.

As indicated, the commercial fishing industry contributes significantly to the economies of all of the Gulf coast states. The predominant commercial marine fisheries resources landed in each state include the following:

Alabama — croaker, flounder, king whiting, sea trout, red snapper, mullet, grouper, swordfish, shrimp, blue crabs, and oysters.

Florida Gulf — ballyhoo, bluefish, blue runner, cigarfish, crevalle, croaker, drum, thread herring, mackerel, mullet, pompano, sea trout, Spanish sardine, tenpounder, flounder, jewfish, king whiting, sea bass, sea catfish, sheepshead, snapper, spot, grunts, mangrove snapper, amberjack, cabio, dolphinfish, grouper, hogfish, menhaden, mojarra, permit, scup, warsaw, swordfish, sponges, scallops, oysters, squid, blue crabs, stone crabs, lobster, and shrimp.

Louisiana — drum, menhaden, sea trout, croaker, flounder, king whiting, mackerel, pompano, red snapper, drum, mullet, shrimp, blue crabs, and oysters.

Mississippi — croaker, drum, flounder, king whiting, menhaden, sea trout, bluefish, mackerel, mullet, pompano, grouper, shrimp, blue crabs, and oysters.

Texas — croaker, drum, flounder, king whiting, sea trout, sheepshead, red snapper, grouper, shrimp, blue crabs, and oysters.

The major fishing ports located in the proposed sale areas are shown in Table III-4.

Table III-4

Major Gulf Area Commercial Fishing Ports

Port	Fish Landings - 1979	
	Pounds (10^6)	Value (10^6 \$)
Cameron, Louisiana	593.1	34.3
Pascagoula-Moss Point, Mississippi	283.8	18.1
Empire-Venice, Louisiana	278.9	28.8
Dulac-Chauvin, Louisiana	246.3	41.5
Brownsville-Port Isabel, Texas	22.0	50.0
Bayou La Batre, Alabama	21.8	34.9
Aransas Pass-Rockport, Texas	19.0	40.0
Key West, Florida	16.5	25.9
Fort Myers, Florida	15.9	17.8
Golden Meadow-Leeville, Louisiana	15.6	22.5
Lafitte-Barataria, Louisiana	10.4	16.6
Apalachicola, Florida	10.4	10.1
Freeport, Texas	8.0	25.0

Note: Data for Intracoastal City and Morgan City, Louisiana, and Biloxi, Mississippi, have been excluded to avoid disclosure of private enterprise.

Source: USDC, NMFS, Fisheries of the United States, 1979.

The fisheries resources in the northwestern Gulf of Mexico have coexisted with petroleum development for over 30 years. At present, the existing data bases cannot support a detailed analysis of the catches, landings, and species composition over the years; however, some suitable data base should become available through the Fishery Management Plans being developed under the auspices of the Gulf of Mexico Fishery Management Council. The fishery of the Gulf of Mexico is dominated by estuarine-associated species, and estuaries and coastal areas are more sensitive to oil spills and oil-related perturbations than the open ocean. Therefore, it should follow that if major adverse impacts have occurred over the years, it should have affected those fisheries. Presently, we have no evidence indicating any lasting impact on these estuarine-associated fisheries.

6. Recreation

a. Coastal Zone

The northern Gulf of Mexico coastal zone is one of the major recreational areas of the U.S., particularly in connection with saltwater fishing (bay, surf, and pier) and beach-oriented activities. Major marine recreational finfish species sought in the coastal zone include sea trout, drum, croaker, flounder, and sheepshead. Additionally, shellfishing (especially crabbing and shrimping) is an important recreational activity among coastal residents. Preliminary results (Schmied, 1980) from the 1978-1979 Marine Recreational Fishing survey sponsored by NMFS estimate 3.21 million saltwater anglers residing in the Gulf states landed more than 42 million fish weighing over 31,500 metric tons during the survey year. Approximately 80% of Gulf fish landed by recreational anglers came from the inshore marine and estuarine areas inland of the Gulf of Mexico shoreline; these fish represented about 65% of the total weight landed.

The shorefronts along the Gulf coasts of Texas, Louisiana, Mississippi, Alabama, and Florida display a diversity of natural landscapes and seascapes. Barrier islands, coastal beaches, bays, sounds, river deltas, and marshes, along with a subtropical climate, provide an ideal setting for outdoor recreation and tourism. The Gulf of Mexico coastal zone includes publicly-owned areas such as national seashores, parks, beaches, and wildlife lands, as well as specially designated preservation areas such as historic and natural sites and landmarks, wilderness areas, wildlife, aquatic and estuarine sanctuaries, and scenic rivers. Commercial and private recreational facilities and establishments such as resorts, marinas, amusement parks, and ornamental gardens also serve as primary interest areas and support services for people who seek enjoyment of the recreational resources influenced by the Gulf of Mexico. A general discussion of the different categories of areas found along the Gulf coast which provide recreational opportunities in the coastal zone and indications on the level of use by residents and tourists are described and graphically depicted in EIS's for Sales 62, 58A, and 65 and can be gleaned from the individual state CZM plans and the SCORP's on file in the four states potentially affected by this proposal.

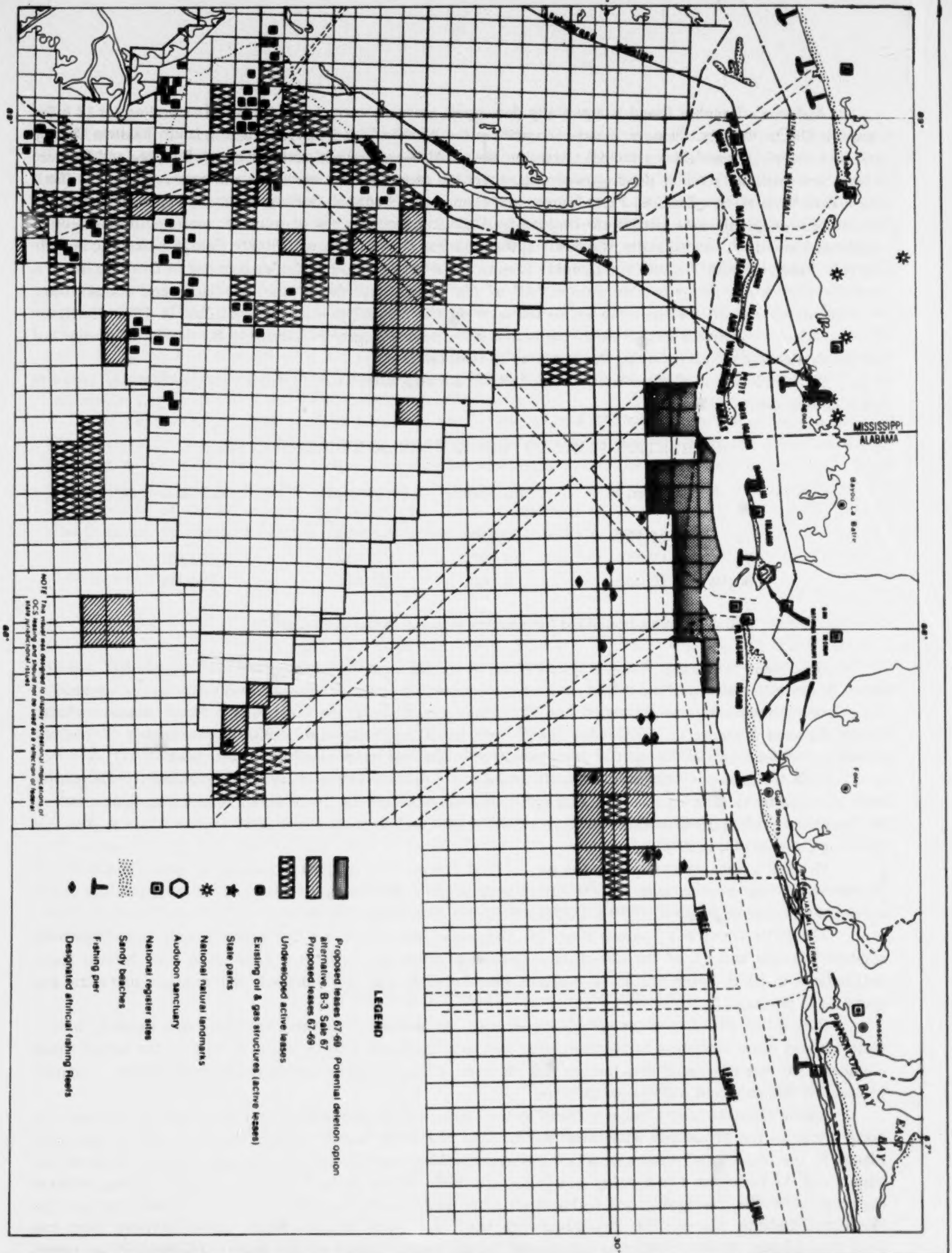
Additionally, BLM has contracted with FWS to make special socioeconomic studies which includes a characterization of the recreation and tourism industries in the Gulf of Mexico coastal areas currently or potentially affected by offshore leasing and development of petroleum. Study reports with a detailed description and analysis of coastal recreation and tourism are completed for Louisiana and Texas. Major findings are summarized in the synthesis papers included in Volume I of the Socioeconomic Study reports for the Mississippi Deltaic Plain Region (Larson, Davis, et al., 1980) and the Texas Barrier Islands Region (Liebow, Butler, Plaut, et al., 1980). Similar studies for coastal areas in Alabama and Florida are currently in progress.

To summarize, the diverse environments found in coastal areas where water and land converge are a magnet for leisure pursuits. The coastal beaches, barrier islands, estuarine bays and sounds, and tidal marshes associated with the Gulf of Mexico shorefront are intensively utilized for recreational activity by residents of the Gulf South and from tourists throughout the nation as well as from foreign countries. The largest concentration of coastal recreators will be found on Gulf coastal beaches most closely associated with urban populations, resort communities, and public parks throughout the spring and summer months.

b. Mississippi/Alabama Nearshore Area

Located on the south side of the Mississippi Sound and west and east of the mouth of Mobile Bay are five islands which are primary recreation areas. The three nearshore Mississippi barrier islands are part of the Gulf Islands National Seashore, and two of those islands are components of the National Wilderness System. Dauphin Island in south Mobile County, another barrier island, is separated by the entrance to Mobile Bay from Pleasure Island which extends all the way to the Florida line. This area and the principle features of concern are graphically described in Figure III-1.

Petit Bois Island is a 7-mile segment of the Gulf Island National Seashore. It was incorporated into the National Wilderness System in 1978 along with Horn Island, its 14-mile sister island, located immediately to the west. The National Park Service management scheme for these two islands is to maintain the barrier island environment in its natural state. By design this is conducive to low density public visitation.



LEGEND
Proposed leases 67-69 Potential deletion option alternative B-3 Sale 67
Proposed leases 67-69
Undeveloped active leases
Existing oil & gas structures (active leases)
State parks
National natural landmarks
Audubon sanctuary
National register sites
Sandy beaches
Fishing pier
Designated artificial fishing Reefs
NOTE: This visual was designed to display recreational implications of OCS leasing and should not be used as a reflection of federal state jurisdictional issues
MISSISSIPPI
ALABAMA
Bayou La Batre
Gulf Shores
Foley
Pensacola
PENSACOLA BAY
EAST BAY
30°
88°
89°
87°

Figure III-1 Existing, Proposed, and Developed Leases; Recreational and Cultural Features; and Other Selected Uses Associated with the Mississippi/Alabama Shorefront Area

Alabama's Dauphin Island is a partially developed, privately-owned, barrier island extending for 14 miles in south Mobile County. Pleasure Island encompasses the 32-mile Gulf front shoreline in south Baldwin County and, like Dauphin Island, is a principal recreation site in Alabama's coastal area. Although Dauphin and Pleasure Islands are principally under private ownership, there are several public recreation and preservation sites (Gulf State Park, Gulf Shores Beaches, Forts Morgan and Gaines, and Audubon Society Sanctuary) on each island, and all the Mississippi/Alabama islands are rimmed by Gulf and bay beaches of prime recreational importance to residents and visitors. Additionally, the newly authorized Bon Secour National Wildlife Refuge is likely to include bayfront lands on both Pleasure and Dauphin Islands, and a large portion of the western end of Dauphin Island is under consideration for public acquisition. All of the islands have dense pine woodlands and contain dune mounds which rise 20 feet or more above sea level on the Mississippi wilderness islands. In 1979 Hurricane Frederick had a significant impact on all the islands with the most apparent damage to the developed portions of the south Alabama islands including the causeway to Dauphin Island.

Some indications of the current levels of public use associated with the major public recreational sites and the islands in general follow:

RECREATION VISITS TO PRIMARY PUBLIC RECREATION SITES*

	Horn Is.	Petit Bois Is.	Ft. Morgan	Gulf State Park
1978	21,552	17,239	147,624	–
1979	17,216	10,257	131,254	2,853,650
1980(½yrs.)	15,030	8,160	51,535	584,700

* Visitation figures provided by resource managers from each park.

Ship Island is the most heavily visited island in the Mississippi portion of the Gulf Islands National Seashore. Major attractions on Ship Island are Fort Massachusetts and the developed south beach on the west end of the island. Cumulatively, an estimated 166,712 visits were made to the Mississippi offshore islands included in the National Seashore in 1978 and 108,819 visits in 1979 (Christenson, 1980). Approximately 25% of the Mississippi islands' visits in the last few years have been to the wilderness islands by private boat.

Prior to Hurricane Frederick, Dauphin Island had a permanent population of approximately 650 people with peak residency growing to over 2,000 during the summer months. There were 775,260 recreational visitors to Dauphin Island in 1970 with projections of 2,700,000 visitors by the year 2000 (South Alabama Regional Planning Commission, 1980).

Pleasure Island, which includes the city of Gulf Shores, has a resident population of approximately 6,000 people which can grow to over 40,000 during peak summer weekends. Recreational visits to Pleasure Island exceeded one million people in 1978 (Gulf Shores Tourist Association, 1978).

The 1979 Travel and Tourism Study for Alabama (Adams) indicated that approximately 21% of Alabama resident travelers and 9% of the out-of-state visitors specified Gulf beaches and Mobile as their favorite travel destinations in 1978. Beach visitors to Alabama were found to stay approximately five days per party trip and spend $175 per stay.

Description of the environment associated with the Mississippi/Alabama nearshore area would be incomplete without some indication of commercial as well as recreational activity in the vicinity of the barrier island complex. The marine coastal area inshore and offshore of the Mississippi and Alabama outer islands is actively utilized for industrial and commercial purposes.

Ingalls Shipyard and a major refinery in the Pascagoula vicinity are 24-hour operations visible from the north shore of the Mississippi wilderness islands. Ship and barge traffic parallels the north side of the outer islands in the intracoastal waterway which traverses the Mississippi Sound approximately midway between the islands and the mainland. Ocean-going vessels (tankers, bulk carriers, and general cargo vessels) awaiting berths at the ports of Mobile, Pascagoula, and Gulfport are often visibly anchored approximately 2-10 miles south of the Mississippi/Alabama islands. The Pascagoula ship channel (38-foot project depth) passes between Horn and Petit Bois Islands. Besides numerous commercial fishing vessels (mainly shrimp boats), 540 ocean-going vessels made round trips through this pass in 1979 (Amundsen, 1980). Several large ships also go to and from Ingalls Shipyard. Ingalls Shipyard has several giant hoist cranes visible for several miles and does some contract work on oil and gas rigs. According to Hansen and Tideman (1980), supertankers in the ULCC and VLCC class are lightering approximately 60 miles south of Mobile Bay (rendevous area - Lat. 29°44'N Long. 88°24'W). Foreign crude oil is transferred to smaller tankers (700 foot class) for daily delivery via the Pascagoula ship channel to Chevron's Bayou Cassott Refinery. The Chevron refinery is undergoing a billion dollar expansion and modification program in anticipation of refining more heavy foreign crude oil. The Mississippi CZM plan indicates over 50% of the refinery's feedstock is currently imported. The remainder is delivered by three submerged and buried submarine pipelines from offshore Louisiana. Considerable ship traffic also passes the Mississippi/Alabama outer islands and enters the coastal zone through the Gulfport and Mobile Bay channels. Commercial discovery of gas has been made in Mobile Bay, and active oil and gas exploration is underway in the pass between Dauphin and Pleasure Islands. The Alabama State Oil and Gas Supervisor (Mobile Press, 1980) has indicated that further petroleum exploration and development in Alabama state waters is anticipated.

In summary, the southernmost islands of the Mississippi and Alabama coasts are primary public and private recreational areas. Alabama's islands are partially developed and prior to Hurricane Frederick accommodated up to 50,000 residents during peak summer weekends. Several million visitors utilize these islands each year for beach type recreation including swimming, fishing, picnicking, camping, and appreciation and understanding of nature, history, and wilderness. These recreational activities currently coexist with marine-related commerce, much of which is directly related to petroleum development.

c. Offshore

The open Gulf of Mexico, or that area extending seaward of the Gulf shoreline to the outward extent of the U.S. Fishery Conservation Zone, encompasses a broad expanse of saltwater which is of intense interest to sports fishermen, generally classed as "deep sea" fishermen, and a small but rapidly increasing number of SCUBA divers. Access to the open Gulf for recreational purposes requires a boat; therefore, some portion of coastal boaters venture into the open Gulf in their private vessels. Other coastal residents, as well as many tourists, rent spaces on charter or headboats for the purpose of deep sea fishing and SCUBA diving in the northern Gulf of Mexico. The recently published Gulf of Mexico Reef Fish Management Plan and DEIS (Gulf of Mexico Fishery Management Council, 1980) indicate there were 579 commercial sport fishing boats or charter boats and headboats operating in the Gulf of Mexico in 1977. The number of private boat owners who use their craft recreationally in the Gulf is not precisely known. The Gulf of Mexico offshore boating population is believed to be substantial and growing but is likely to be affected should fuel cost and availability continue to be a major problem.

The following 1978 boating and related statistics provide some information about Gulf coastal boats and boat owners from which we can deduce the scope and importance of boating to offshore marine recreational endeavors.

GULF OF MEXICO BOATING STATISTICS

State	Population (Thousands)	Total Registered Boats	% of Total Registered Boats in the U.S.	One Boat Per ( ) Persons	Registered Boats 16' or Greater
Alabama	3,725.1	178,259	2.2	20.9	47,477
Florida	8,657.7	459,623	5.7	18.8	211,363
Louisiana	3,931.4	281,529	3.5	13.9	92,987
Mississippi	2,387.8	95,607	1.2	24.9	25,714
Texas	12,867.2	535,586	6.7	24.0	210,673
TOTAL	31,569.2	1,550,604	19.3	20.3	588,214

Sources : U.S. Dept. of Transportation, Coast Guard, 1979; Resource Report to BLM, New Orleans OCS Office; National Association of Engine and Boat Manufactures, 1979; and Gulf of Mexico Regional Boating Analysis, 1978.

The Gulf coast region has approximately 15% of the nation's population and accounts for over 19% of boat registrations. After consulting with state boat registration officials in the Gulf region, the U.S. Coast Guard has estimated that 10% of all registered boats may be used offshore. They consider boats 16' or greater potentially capable of venturing offshore. Studies by Ditton and Graefe (1978) and Ridgley (1975) estimated that between 4%-12% of the registered boats are potentially part of the offshore boating population. Therefore, of the more than one-half million registered boats potentially capable of going offshore, an estimated 60,000-180,000 private boats may be used for recreational endeavors on the OCS.

Preliminary results (Schmied, 1980) from the 1978-1979 Marine Recreational Fishing survey estimated that about 21% of all sport fish landed by saltwater anglers from the Gulf states came directly from the Gulf of Mexico. These fish represent approximately 34% of the total weight of the marine recreational fish landed in the Gulf region. A further breakdown of the recreational fish catch in the Gulf indicates that about 9% of the fish landed, representing 23% of the weight of all fish landed in the Gulf region, come from the offshore FCZ which is synonymous with the OCS.

The Gulf of Mexico Fishery Management Council, NMFS, and all Gulf coastal states except Louisiana are encouraging and supporting the development of artificial reefs to facilitate and enhance offshore marine recreational fishing. Approximately 32 permitted artificial fishing reefs (12 liberty ship reefs) have been established on the OCS in the Gulf of Mexico. Additionally, three proposed marine sanctuaries (Flower Gardens, Buccaneer Field, and the Florida Middle Grounds) on the OCS, several shipwrecks, and over 3,000 emergent oil and gas structures are known to attract recreational interest offshore.

To summarize, marine recreational fishing and SCUBA interest on the northern Gulf of Mexico continental shelf is: (1) believed to be site specific; (2) increasing in popularity; (3) very productive and rewarding to participants; and (4) has a recognizable effect on coastal economies.

7. Tourism

Tourism within the Gulf region generally surrounds such activities as sightseeing, swimming, sunbathing, bird watching, hiking, amusement parks, conventions, sports, and festivals. These occurrences are widespread over the region and contribute significantly to the economic well-being at both local and state levels. For example, the following data indicate tourist-related travel expenditures as well as associated tax receipts for selected counties or parishes in Louisiana and Texas.

TOURISM DATA

Area	Travel Expenditures ($1,000)	State Tax Receipts ($1,000)	Local Tax Receipts ($1,000)
Louisiana (1976)			
East Baton Rouge Parish	$ 104,016	$ 4,082	$ 2,872
Jefferson Parish	162,131	6,362	3,187
Orleans Parish	984,362	38,627	27,438
Texas (1978)			
Galveston County	$ 132,218	$ 4,784	$ 1,369
Harris County	1,340,067	43,204	12,861
Nueces County	136,262	4,640	1,352

Source: The Impact of Tourism in Louisiana, Louisiana Parish Police Jury Association.
A Socioeconomic Characterization Study of the Texas Barrier Islands Ecosystem (Liebow, Butler, Plaut, et al., 1980).

These selected Louisiana parishes and Texas counties account for over 75% of the total study area tourist-related travel expenditures and tax revenues in their respective states. Furthermore, it has been estimated that one-tenth, one-fourth, and one-fifth of all out-of-state tourists in the states of Alabama, Florida, and Mississippi spent time and money in the Gulf region.

According to a study prepared for the Alabama Bureau of Publicity and Information (Adams), tourist-related travel expenditures in Alabama amounted to about $2.2 billion in 1979. Also, the $2.2 billion travel revenue produced more than $85 million in direct retail tax collections for the state of Alabama, or about 17% of the $494 million in retail sales tax collected by the state in 1979. This still does not include the contributions of tourists to state gasoline or local tax collections. At least 10% of these visitors cited activities along the Gulf coast as their major interest, e.g., swimming and sunbathing.

In Florida, tourist-generated business receipts were estimated to be $16 billion in 1979 with associated tax revenues of over $735 million, according to the *1979 Florida Tourist Study* prepared by the Florida Division of Tourism. The tourist-generated employment was estimated to be 533,096, or about 14.0% of Florida's total work force in 1979. Of the top ten counties for visitor destinations, including both air and automobile travelers, half were Gulf coast counties: Pinellas County (3,640,300 visitors); Hillsborough County (2,084,400); Escambia County (1,557,500); Bay County (1,463,100); and Okaloosa County (1,044,900). About 65% of all the visitors surveyed indicated that the Florida beaches were among their primary interests in the area. Other attributes of Florida which ranked highly among the surveyed tourists were general rest and relaxation, such as Disney World, fishing, and water sports.

According to data from the *Mississippi Deltaic Plain Ecological Characterization Study* (D. K. Larson, et al., 1980), tourism along the Mississippi Gulf coast generated approximately $17.25 million of value and involved 2.9 million out-of-state visitiors in 1080. Of the three counties that comprise Mississippi's Gulf coast, Harrison County is responsible for 85% of the region's tourist trade. The main attraction is the white sand beach along the Pass Christian-Biloxi stretch of coast where motels/hotels, restaurants, public parks, and other recreational and tourist facilities are clustered.

Section IV

Environmental Consequences

IV

IV. ENVIRONMENTAL CONSEQUENCES

A. Resource and Offshore Infrastructure Estimates

As previously indicated in Section I, a total of 472 tracts in the Gulf of Mexico containing an area of 2,458,827 acres are proposed to be leased for oil and gas exploration and development by these two sales. These tracts are located from 3-140 nmi from the coasts of Texas, Louisiana, Mississippi, Alabama, and Florida in water depths ranging from 2-2,400 m. The amounts of recoverable resources (mean values) that may be discovered as a result of these sales are estimated by USGS at 50.56 million barrels of oil and 912.57 billion cubic feet of gas for Sale 67, and 26.63 million barrels of oil and 614.06 billion cubic feet of gas for Sale 69. Table IV-1 contains this and other data on the combined resources, daily peak production, and offshore development. The combined mean resource and development estimates are used in analyzing the potential and expected impacts of exploration and development activities on the human environment.

B. Development Assumptions and Scenarios

1. Offshore Development Areas and Scenarios

For purposes of analysis, the proposed tracts have been divided into four offshore development areas: Texas, Louisiana, Upper Gulf (Mississippi-Alabama-Florida "panhandle" area), and Florida shelf (Figure IV-1). The number of tracts, estimated resources, and offshore development related to the four areas are included in Table IV-2, and the estimated development timetable or schedule for each offshore development area is summarized in Table IV-3. Table IV-4 provides resource and offshore development estimates for deletion modification alternatives.

2. Transportation Assumptions

a. Proposed OCS Sales 67 and 69 (Sales Specific Assumptions)

(1) Production in the Texas and Louisiana offshore development areas will be connected by new pipelines to existing trunk pipelines for transportation to existing onshore processing facilities in Texas and Louisiana.

(2) Production in the Upper Gulf offshore development area will be connected by new pipelines to existing trunk pipelines for transportation to existing onshore processing facilities in Mississippi.

(3) Production in the Florida shelf offshore development area will be gathered by new pipelines to a central point for storage and transfer to shuttle tankers for shipment to existing onshore processing facilities in Texas, Louisiana, and Mississippi.

b. Cumulative Impact Assumptions

The magnitude of the resource estimates and/or the dispersed geographic distribution of most of the tracts indicate it is unlikely that oil and/or gas finds resulting from the proposed sales would be sufficient in magnitude to economically justify new trunk pipelines to shore. However, the potential oil and gas finds of the proposed sales could contribute to a total demand for new trunk pipeline capacity to shore. In order to consider this possibility, the following cumulative impact assumptions will be used for impact analysis purposes:

(1) Production of gas in the Texas offshore development area resulting from the proposed sales could contribute to the eventual construction of an additional gas pipeline with a landfall somewhere along the coast of Texas.

Table IV-1

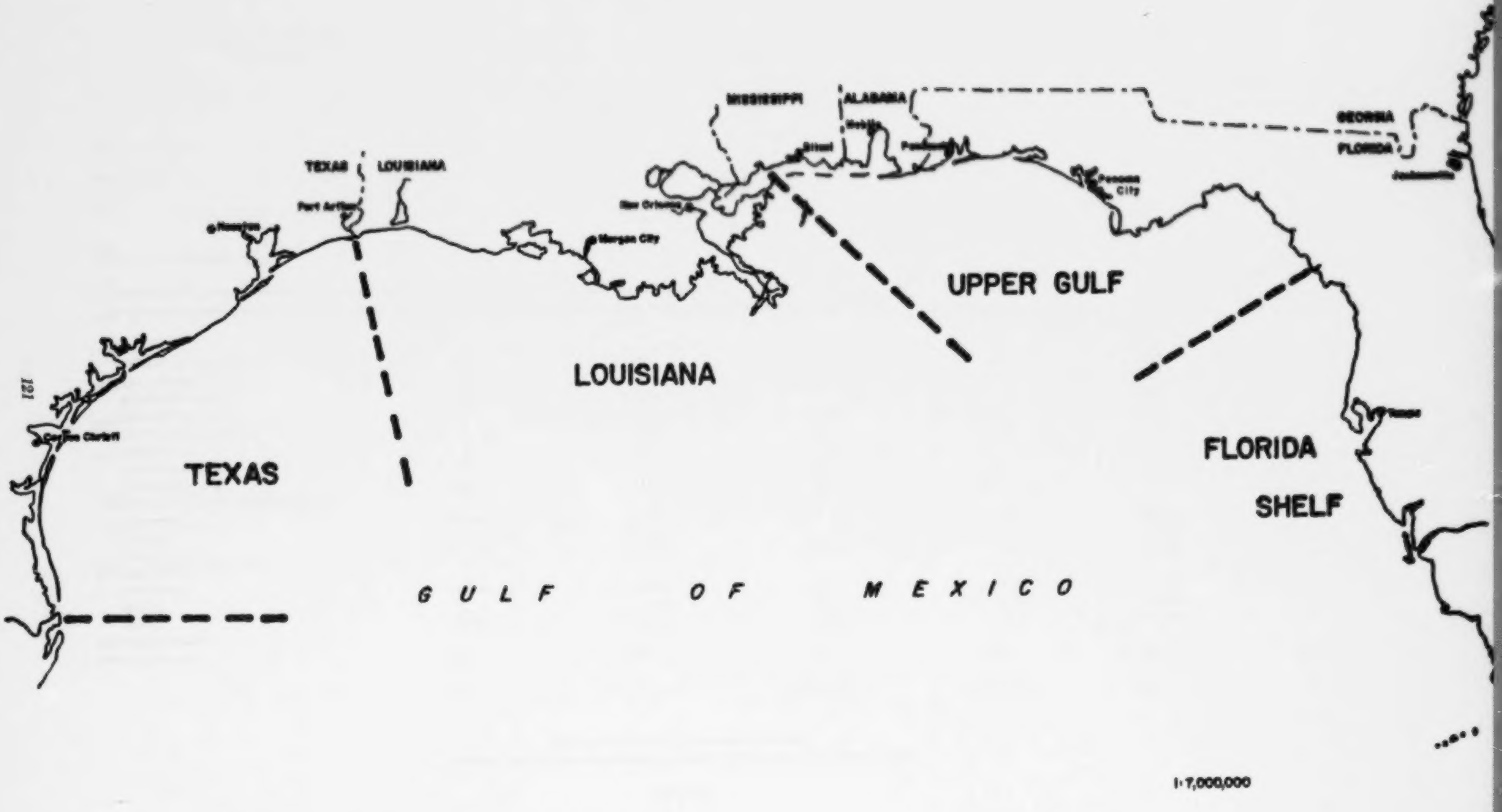
Summary of Estimated Resources and Offshore Development

	Low	Mean	High
Resources			
Oil (million barrels)			
Sale 67	30.20	50.56	162.47
Sale 69	18.07	26.63	37.88
Combined*	48.27	77.19	200.35
Gas (billion cubic feet)			
Sale 67	512.08	912.59	2113.49
Sale 69	403.97	614.06	826.90
Combined*	916.05	1526.63	2940.39
Daily Peak Production			
Oil (barrels)			
Sale 67	12,000	21,000	63,000
Sale 69	7,000	10,000	16,500
Combined*	19,000	31,000	79,500
Gas (million cubic feet)			
Sale 67	220	380	880
Sale 69	170	253	353
Combined*	390	633	1,233
Offshore Development (Combined Sales)*			
Exploration Wells	115	225	450
Delineation Wells	115	225	450
Platforms	17	30	65
Development Wells	135	220	500
Underwater Completions	1	4	7
Offshore Pipeline Miles	60	285	490

* Combined OCS Sales 67 and 69 estimates computed by BLM. The combined estimates are the sum of the separate estimates and as such do not represent statistically accurate probability estimates of the low (5%), mean, and high (95%) values computed for each sale or that would be computed for a single sale consisting of all the tracts included in the separate sales.

Source: USGS estimates, 1980.

Figure IV-1. Offshore Development Areas[1]


TEXAS
LOUISIANA
MISSISSIPPI
ALABAMA
GEORGIA
FLORIDA
Houston
Port Arthur
Corpus Christi
Morgan City
New Orleans
Biloxi
Mobile
Pensacola
Panama City
Jacksonville
Tampa
TEXAS
LOUISIANA
UPPER GULF
FLORIDA SHELF
GULF OF MEXICO
1:7,000,000

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[1] The areas delimited are used for analyzing environmental impacts only.

Table IV-2

Resource and Offshore Development Estimates for Offshore Development Areas
(Mean Resource and Development Estimates)

	Texas	Louisiana	Upper Gulf	Florida Shelf	Total
Tracts (Total No.)	106	199	30	137	472
Oil (million barrels)					
Sale 67	15.07	21.33	4.45	9.71	50.56
Sale 69	2.16	8.55	6.76	9.16	26.63
Combined[1]	17.23	19.88	11.21	18.87	77.19
Gas (billion cubic feet)					
Sale 67	307.53	491.87	112.25	0.92	912.56
Sale 69	283.08	299.66	30.10	1.22	614.06
Combined[1]	590.61	691.53	142.35	2.14	1,526.62
Offshore Development (Combined Sales)[2]					
Exploratory Wells	63	99	16	47	225
Delineation Wells	63	99	16	47	225
Platforms	9	14	3	4	30
Subsea Completions	0	4	0	0	4
Development Wells	60	111	20	26	220
Exploratory Tracts	63	99	16	47	225
Development Tracts	9	18	3	4	34
Pipeline (Offshore Miles)	75	151	25	34	285

[1] Combined OCS Sales 67 and 69 estimates (BLM estimates by addition of USGS estimates for each sale). (See footnote for Table IV-1.)

[2] Development estimates prepared by BLM based on USGS oil and gas estimates for each development area.

Source: BLM estimates, 1980.

Table IV-3

Offshore Development Scenarios (1982-1992): Texas-Louisiana-Upper Gulf-Florida Shelf Offshore Areas
(Mean Resource Estimates)

	Exploratory/Delineation Wells Drilled				Platforms Installed				Development Wells Drilled				Offshore Pipelines (Miles)				Percent Peak Production			
Year	TX	LA	Upper Gulf	Florida Shelf	TX	LA	Upper Gulf	Florida Shelf	TX	LA	Upper Gulf	Florida Shelf	TX	LA	Upper Gulf	Florida Shelf	TX	LA	Upper Gulf	Florida Shelf
1982	18	27	4	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1983	29	46	7	22	1	2	0	0	8	0	0	0	0	0	0	0	7	7	0	0
1984	32	50	8	24	3	4	1	1	9	12	2	2	6	11	0	0	23	17	10	7
1985	23	37	6	18	2	2	1	1	10	12	4	4	9	20	6	7	41	27	30	23
1986	24	38	7	17	2	3	0	1	14	18	4	7	11	23	3	5	66	42	50	50
1987	0	0	0	0	0	2	1	0	9	24	5	5	25	50	9	11	82	63	75	69
1988	0	0	0	0	1	1	0	1	6	16	5	4	17	34	7	7	95	76	100	85
1989	0	0	0	0	0	2*	0	0	4	13	0	4	7	13	0	4	100	87		100
1990	0	0	0	0	0	2*	0	0	0	15	0	0	0	0	0			100		
1991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Totals	126	198	32	94	9	18	3	4	56	118	20	26	75	151	25	34				

* Subsea completions.

Source: BLM estimates, 1980.

Table IV-4

Resource and Offshore Development Estimates for Deletion Modification Alternatives[1]

	B-1			B-2			B-3
	Biologically Sensitive Tracts			Deepwater Tracts			Nearshore (Miss./Ala.) Tracts
	Sale 67	Sale 69	Combined Sales[2]	Sale 67	Sale 69	Combined Sales[2]	Sale 67
Number of Tracts	83	43	126	36	23	59	21
Resources:							
Oil (million Barrels)	17.00	7.43	24.43	18.86	0.87	19.73	4.2
Gas (billion cu. ft.)	167.41	36.89	204.30	207.82	19.04	226.86	111.5
Exploratory wells	40	40	80	20	12	32	10
Delineation wells	40	40	80	20	12	32	10
Development wells	35	10	45	40	0	40	15
Platforms	6	2	8	5	0	5	2[3]
Subsea Completions	0	0	0	4	0	4	0

[1] Mean resource estimates.

[2] Combined sale estimates computed by BLM.

[3] BLM estimate.

(2) Production of oil in the Louisiana offshore development area resulting from the proposed sales could contribute to the eventual construction of one or more additional pipelines with landfalls somewhere along the coast of Louisiana.

(3) Production in the Upper Gulf offshore development area resulting from the proposed sales could contribute to the eventual construction of a new trunk pipeline with a landfall in Mississippi or Alabama.

(4) Production of oil in the Florida shelf offshore development area resulting from the proposed sales could contribute to the eventual construction of a trunk pipeline with landfalls along the west coast of Florida.

C. General Impact Producing Factors and Related Environmental Effects

The OCS oil and gas development activities which would result from the proposed sales could eventually result in a variety of impacts on the natural environment, air and water quality, land use patterns, the aesthetic quality of the coastal zone, the adequacy of local infrastructure, and the local economic and social well-being. This section provides a general overview of how routine operations and occasional accidents attendant to OCS oil and gas development generate effluents or impact agents which, either directly or indirectly, can cause adverse environmental effects. The probable adverse impacts are briefly described in general terms.

Every effort has been made to quantify possible impact-producing factors which may result from these combined sales and the potential and expected effects of these factors. However, there are many areas in which quantification is not practicable because of the lack of specific data and the high degree of uncertainty pertaining to the factors which determine the character of impacts.

1. Oil Spills and Other Accidents

In the course of complex OCS operations involving heavy equipment, flammable materials, working at sea with many employees, and reliance on complex technology, it is inevitable that accidents will occur. Proper analysis of these accidents is a complex problem. The history of OCS petroleum development accidents in the Gulf of Mexico provides a substantial data base for estimating the frequencies of future accidents. More detailed discussions of these topics are included in the FEIS for OCS Sale 58 (USDI, BLM, 1979).

a. Oil Spill Incidents and Causes

Oil spills are recognized as the most common cause of environmental pollution associated with offshore oil and gas activity. All phases of petroleum development from exploration to production have the potential to cause or contribute to an oil spill. Until 1971 only those spills of major significance (50 barrels or more) were recorded. In the beginning of 1971, USGS began to record all events resulting in the spillage of hydrocarbons into the waters of the Gulf of Mexico. This data was recorded in a computer data base (GIPSY) for spills of one barrel or more and monthly reports for spills of less than one barrel.

The amount of oil released into the Gulf of Mexico during the period between 1971-1975 from small spills (50 barrels or less) decreased by more than one-half (Danenberger 1976), which is a reflection on the major advances of the technology and operating philosophy of the offshore industry to prevent oil spills.

In order to take into account these technological advances to combat the loss of hydrocarbons, the spill history for the years 1974-1979 will be used to determine statistics for oil spills from future development in the Gulf of Mexico.

Table IV-5 contains the data on the annual number and volume of spills for this period in the Gulf of Mexico. The statistics for this period are believed to be representative of the general character of oil spills over a much longer period of time and indicate the following general spill characteristics:

Table IV-5

Number of Oil Spills in Each Size Category by Year (1974-1979) Gulf of Mexico Outer Continental Shelf

Year	Less than 1 Barrel	1-14 Barrels	14-49 Barrels	Total of Spills less than 50 Barrels	50-499 Barrels	500-999 Barrels	1,000-9,999 Barrels	10,000 Barrels or More	Total of Spills 50 Barrels or More	Spills of Unknown Volume or Trace Amount	All Spills Total
1974	1,051	75	5	1,131	7	0	1	1	9	6	1,146
1975	1,021	105	7	1,133	2	0	0	0	2	0	1,135
1976	881	75	2	958	2	0	1	0	3	1	962
1977	693	68	5	766	4	0	0	0	4	1	771
1978	796	92	4	892	2	1	0	0	3	2	897
1979	596	103	4	703	5	0	1	0	6	0	709
1974-79	5,038	518	27	5,583	22	1	3	1	27	10	5,620

Volume of Oil Spilled (Bbls) in Each Size Category by Year (1974-1979) Gulf of Mexico Outer Continental Shelf

1974	263	327	125	715	760	0	2,213	19,833	22,806		23,521
1975	255	481	159	895	266	0	0	0	266		1,161
1976	220	269	31	520	714	0	4,000	0	4,714		5,234
1977	173	260	114	547	670	0	0	0	670		1,217
1978	199	264	141	604	239	900	0	0	1,139		1,743
1979	149	378	102	629	655	0	1,500	0	2,155		2,784
1974-79	1,259	1,979	672	3,910	3,304	900	7,713	19,833	31,750		35,660

Note: Total volumes are approximate; volumes for spills less than one barrel are assumed to be spills of ¼ barrel each, as no statistics are available.

Sources: USGS GIPSY Data Base (1980) and monthly reports on OCS operations in the Gulf of Mexico (1974-1979).

- The vast majority of spills are small (99.34% were less than 50 barrels, and 89.64% were less than 1 barrel).

- Over a period of several years, most of the volume of oil spilled was contributed by a few large spills (4 spills (0.07%) contributed 77.25% of the total volume spilled).

- Major spills (1,000 barrels and over) are few in number and exhibit a low average number of occurrences per year.

During the six year period (1974-1979), approximately 1.8 billion barrels of oil were produced from the Gulf of Mexico with a spill rate of 0.002%, or 1 barrel spilled for 50,000 barrels produced. USGS mean resource estimates for Sales 67 and 69 tracts combined is 77.19 million barrels of oil produced, with 11.49 million barrels produced in the peak year. Using the spill rate previously calculated, the estimated volume of oil spilled in the year of peak production will be approximately 240 barrels.

(1) Pipeline Accidents

Offshore pipelines are exposed to numerous hazards during their lifetime, including hydrodynamic forces, soil instability, corrosion, and accidental damage caused by anchors or other objects. In the design phase of a pipeline, the most likely hazards are defined and design measures are taken to minimize or eliminate these risks. However, it is not always possible to estimate all the hazards to which a pipeline will be exposed.

During the period from 1969-1979, a total of 19 pipeline breaks and/or leaks, each with a spillage of 50 barrels or more, were recorded for OCS operations in the Gulf of Mexico (USGS, 1980). More oil has been spilled into the Gulf of Mexico from pipeline accidents than from all other types of OCS petroleum production accidents. The total volume of spilled oil due to these pipeline accidents is approximately 40,674 barrels. Four (21.05%) of these 19 spills could be directly attributed to anchor dragging. These four spills contributed 49.32% of the total volume of oil spilled due to pipeline breaks and/or leaks. It should be noted that a large percentage of these anchor drag accidents were the result of anchoring drilling rigs, derrick barges, and pipelaying barges. Only a small percentage of the accidents were caused by anchoring caused by small ships. Dragging anchors across pipelines causes them to rupture, dislocate, sink, or split.

Other causes of pipeline failure, resulting in 31.59% of the total number of spills (only 28.76% of the total volume of oil spilled), include movement and/or shear due to wave action, unstable bottom conditions, fouling of trawl gear on subsea valves and taps, and internal corrosion. The remainder of the spills (47.37%) were listed under "unknown cause" (21.9% of the total volume spilled). USGS is unaware of a single documented instance in the Gulf of Mexico of trawl board damage to pipeline, although trawling gear such as nets, ropes, or tickler chains frequently hang up on pipeline-related obstructions including taps and valves.

During the 1969-1979 period discussed above, the total production in the Gulf was approximately 3.6 billion barrels, with a spill rate of 0.0011%. As of 1979 the pipeline network serving the Gulf of Mexico OCS included almost 11,000 miles of pipeline on the federal sector plus approximately 1,100 miles of pipeline that transport OCS production through state waters (USGS, in USDI, BLM, 1980c, p. 78).

Although it is not feasible to discuss all of the hazards to pipelines on the OCS, a brief discussion of some of the major causes for pipeline failure and measures to possibly mitigate these hazards is presented here.

As stated earlier, there are four major causes of pipeline failure—anchor dragging and trawling, corrosion, unstable geological conditions, and hydrodynamic forces. The problems associated with anchors and trawling have already been briefly discussed. Large, oil activity-related vessels, such as pipelaying barges, etc., require extensive anchoring systems while operating (Figure IV-2). It is not uncommon for these anchors to bury to depths of 5-6 m, whereas commercial vessel anchors bury 1-2 m (Figure IV-3). Since it is not feasible to install pipelines to a depth below that affected by large anchors, pipelines in an area where rigs are operating should be buoyed to prevent anchor damage.

Minimizing the potential for pipeline failure due to corrosion is usually an objective of the design of the specific pipeline. Corrosive preventive methods include coating the pipeline with protective material such as plastic, asphalt, and possibly cement; the use of cathodic protection; injecting chemical inhibitors, once the pipeline is operating; and coating the interior of a pipeline with a thin layer of protective paint to inhibit internal corrosion.

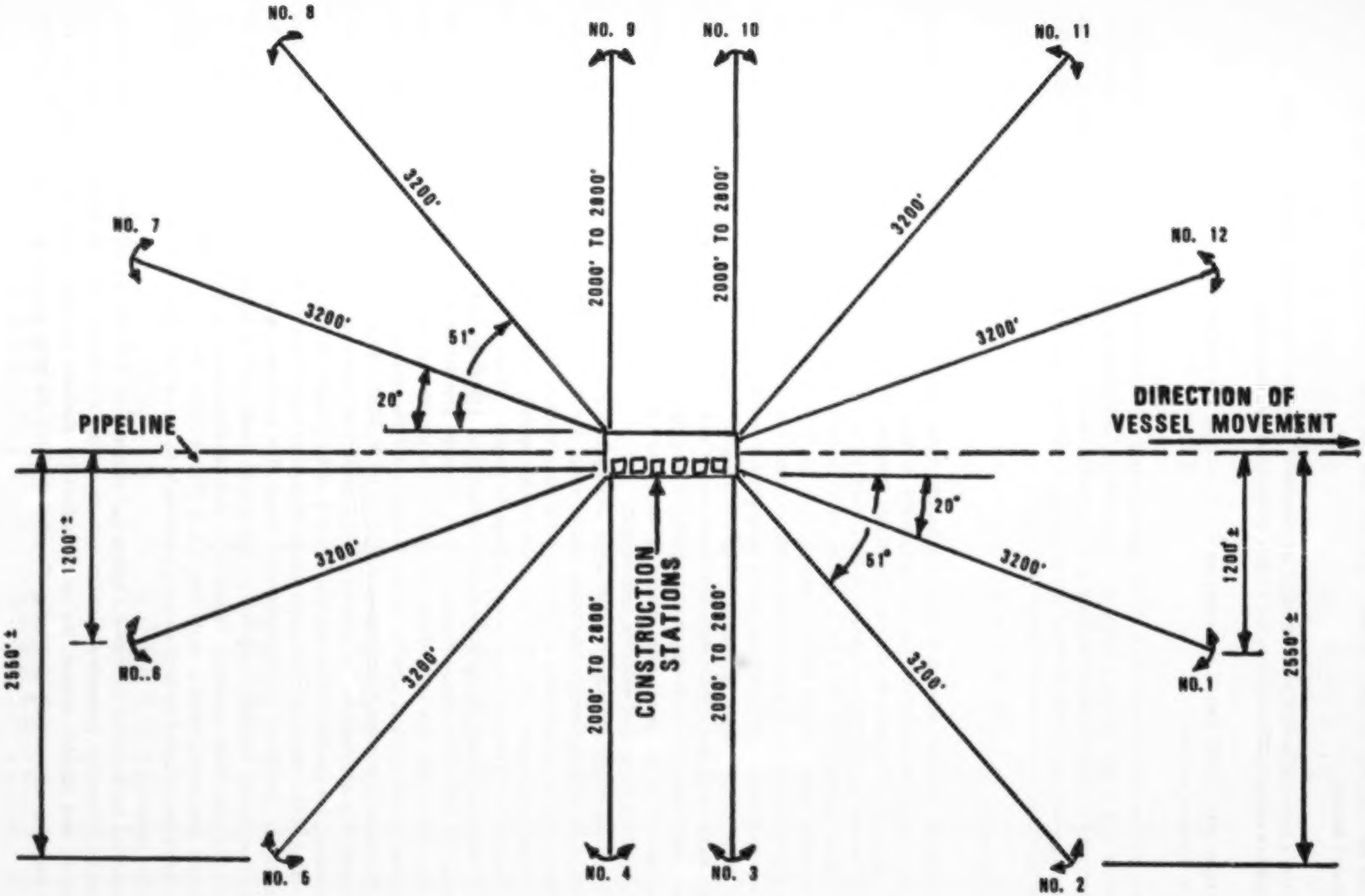
NO. 8
NO. 9
NO. 10
NO. 11
NO. 7
NO. 12
3200'
2000' TO 2800'
51°
20°
PIPELINE
DIRECTION OF
VESSEL MOVEMENT
CONSTRUCTION
STATIONS
1200' ±
2550' ±
NO..6
NO.1
NO. 5
NO. 4
NO. 3
NO. 2

Figure IV-2. Typical Initial Anchor Pattern For A 120 X 140 Foot Lay Barge In 35 To 100 Feet Of Water

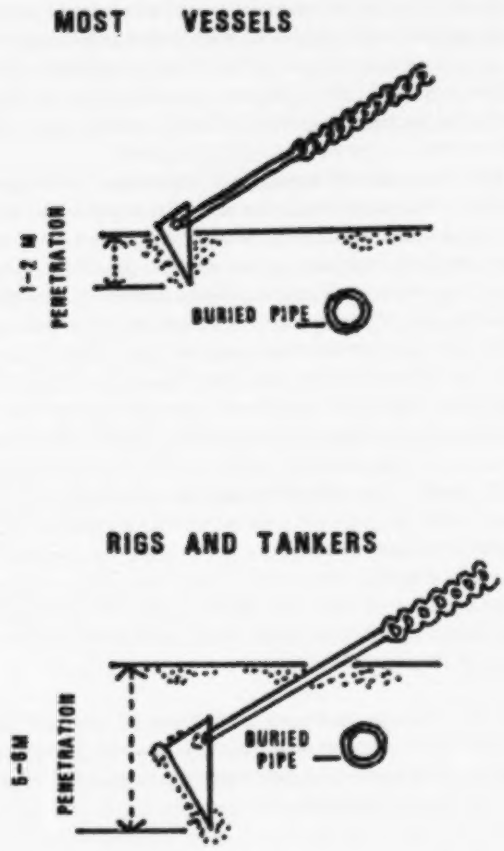
MOST VESSELS
1-2 M PENETRATION
BURIED PIPE
RIGS AND TANKERS
5-8M PENETRATION
BURIED PIPE

Figure IV-3. Schematic Of Anchor Penetration

Source: NERBC, 1979

Geologic hazards are also capable of causing pipeline failure. These hazards can be divided into sediment instability and seismic activity.

Delta areas (Mississippi and Atchafalaya Deltas) are considered particularly hazardous areas because of sediment instability caused by infavorable, fine-grained cohesionless sediments with low bearing strengths. Deposition is rapid, forming a loose, very unstable sediment framework which is prone to slumping and mudslides. The stress forces placed on pipelines by such sediment movement could cause a pipeline to shear.

Seismic activity is usually associated with fault movement and tectonic deformation, but this type of geologic hazard can also place stresses on pipelines by causing sediment failure, mass movement of sediment, liquefaction, slumping, landslides (mudslides), and ground motion (shaking). It has been estimated that although fault movement places stresses on pipelines placed across the fault zone, a pipeline can withstand a vertical displacement of 15-25 feet before failing (Arnold, 1967). Severe ground motion is capable of damaging a pipeline's protective coating or weakening its structural integrity as well as inducing sediment failure which can cause a pipeline to fail.

In an attempt to minimize the potential for pipeline failure due to the geologic hazards described above, the information obtained during a preconstruction route survey is analyzed to determine the route which is the most safe and stable for pipeline placement. Dense-fine to medium-grained sands are the most preferred sediment type, although sands interlayed with stiff, compact clays would also provide a stable support foundation for pipelines. Areas with active faults and mudflow potential should be avoided if possible or design measures should be implemented to reduce the potential risk of pipeline failures caused by these features.

Once sediment scour has removed sediment from around a pipeline, it becomes exposed to stresses from hydrodynamic forces such as wave and current activity. This becomes a serious problem when large quantities of sediment have been removed from under the pipeline as spanning occurs. This spanning subjects a pipeline to additional stresses from sagging and water flow around the line. If the current velocity is sufficiently high, the pipeline may begin to vibrate, hence damage to the protective coating and/or the pipeline may occur.

Starting in July 1980, BLM added the following requirements to the OCS Pipeline Procedures Guidebook dated February 13, 1978, as amended, for pipeline installation on the federal OCS in order to mitigate incidents of pipeline failure due to the causes discussed above.

(a) All pipelines will be installed or laid to a minimum of three feet below the level of the mudline out to and including 200 feet water depth, except at pipeline crossings. Any deviation must be justified at the time of application.

(b) All valves and taps must be provided with a minimum of three feet of actual cover either with soil or sandbags. Approved valve protection may be used; however, they must be installed so that the top does not protrude above the level of the mudline. Any deviation must be justified at the time of application.

(c) All pipeline crossings shall be cement-bagged with a minimum of 18 inches between the lines with the uppermost line having a minimum of three feet of cover in the form of cement bags installed so as to provide a three to one (3:1) slope with a crown width that is one and one-half (1½) times the pipe diameter. Any deviation must be justified at the time of application.

To further mitigate incidents of pipeline failure, the following sections have been deleted from the Guidebook: Part II, Page 4, Section G, Subsections 1, 2, and 3; and Part IV, Page 1.

Other features under development which serve to further mitigate against accidents and are now being field tested by industry include: continuous metering systems, automatic high pressure shut-downs, and remotely controlled mainline block valves that can isolate sections of the line.

(2) Blowouts

It is possible for wells to blow out of control during drilling operations, completion, and production. Blowouts may be prevented during drilling by increasing mud weight and activating blowout preventers. When a well is completed, a subsurface safety device is installed to prevent the well from blowing out if surface control is lost.

Information from the northern Gulf of Mexico for the period of January 1969-December 1979 shows a total of 56 blowouts, with only 9 blowouts resulting in the loss of oil and/or condensate (USDI, GS, 1980). The total spillage from these nine incidents is approximately 56,225 barrels, with four blowouts contributing either minimum amounts or unknown amounts. Total production for the northern Gulf of Mexico during this period was approximately 3.6 billion barrels of oil and condensate (USDI, GS, 1980), resulting in a spill rate of 0.0015%.

Most blowout spillage results from producing oil wells, not from wells being drilled. Producing oil well blowouts normally result from equipment malfunctions, workover procedures, human errors, storms, and collisions. Northern Gulf of Mexico OCS statistics indicate that an average of one blowout occurs for every 250 wells drilled (Danenberger, 1980). No blowouts resulting in significant spills of oil or condensate have been reported from the northern Gulf of Mexico since December 1974 when a 200-barrel blowout occurred during repairs of hurricane-caused damage (USDI, GS, 1979).

A serious blowout did occur, however, in the southern Gulf of Mexico off the Mexican coast. A Petroleos Mexicanos (Pemex) platform blewout on June 3, 1979, near the fishing village of Ciudad del Carmen, one of the world's richest shrimping/fishing grounds. Subsequent to the blowout, a mixture of escaping oil and gas ignited, destroying the well and a semisubmersible platform valued at $22 million. No lives were lost. The Pemex disaster resulted in the release of an unknown quantity of natural gas and an estimated 30,000 barrels of crude oil per day. On July 9, 1979, it became the largest oil spill in history by surpassing the Amoco Cadiz disaster off the coast of France in 1978. Despite repeated attempts to control the well by capping and directional drilling of relief wells, it continued to flow out of control until successfully capped on March 23, 1980. An estimated 3.3 million barrels (140 million gallons) of oil were spilled during the 295 days of uncontrolled flow (OSIR, 1980). Some oil reached Texas beaches during the late summer and early fall of 1979 but was kept off U.S. Gulf coast beaches during the winter months by seasonal circulation patterns. It is very unlikely that an oil spill of this magnitude could occur in the U.S. Gulf of Mexico OCS region as a result of this proposal because the geology, oil/gas resource estimates, drilling operations, regulations, and inspection procedures are very different from the ones employed by Pemex.

Two gas well blowouts have occurred in the general vicinity of the Flower Garden Banks, but they had no impact on the Banks (Section IV.D.1.a.(1) below).

Impacts from oil spills will be determined by the amount of oil reaching the coast, duration of the continuing spill, weathering of oil prior to reaching coastal areas, and effectiveness of mitigating measures taken by appropriate federal and state agencies.

(3) Explosions and Fires

Fires have always been a major hazard in the petroleum industry. OCS operations are no exception. USGS statistics (USDI, GS, 1980) indicate that most of these fires have been extinguished before serious damage and pollution occurred. During the period of January 1969-December 1979, a total of 306 explosions and fires were reported; most were of relatively minor consequences. However, 13 (4.25%) resulted in near or total loss of the platform or rig, and 11 (3.59%) resulted in spills. The magnitude of spills ranged from less than 1 barrel to 53,000 barrels. Total spillage was 84,086 barrels, and two of the 11 spills contributed 99.3% of the total.

Due to the history of fire-related massive oil spills, OCS Orders were amended to require extra safety precautions. To eliminate blowouts due to malfunctioning velocity-actuated downhole safety devices, OCS Order No. 5 requires surface-actuated safety devices. Since 1971 explosion and fire accidents have resulted in no more than minimal (20 barrels or less) oil spills in the Gulf of Mexico (USDI, GS, 1979).

(4) Severe Storms - Hurricanes

Only one severe storm has caused significant oil spillage since the start of federal OCS oil and gas activities in 1954. Hurricane "Hilda" passed over the waters of the Gulf of Mexico off central Louisiana on October 3, 1964, causing the destruction of three platforms on the OCS. Approximately 12,000 barrels of oil were spilled from tanks used for the storage of produced oil prior to its transshipment by barge. However, there were no records of any resultant environmental damages or incidents of major pollution reported.

Between 1899 and 1977 the area of extensive offshore oil and gas production activity off central Louisiana has been subjected to seven hurricanes of greater intensity than "Hilda." Five of them occurred before the start of federal OCS activities in 1954 while the other two were in more recent years. The same area has been hit by three major hurricanes since 1964. There is no record of oil spillage related to any of these storms.

The Pemex Ixtoc-1 oil spill in the Bay of Campeche off the east coast of Mexico might have had a greater impact on the Texas coastal areas except that hurricane "Claudette" tended to disperse the spilled oil and perform a cleaning action on the beaches by carrying suspended matter offshore. Although the quantity of oil spilled was of considerable magnitude, there is great disparity between how much was spilled when the well first blew and how much was later being discharged per day. Depending on whether independent authorities, consultants, or government officials were consulted, the quantity of the initial spill varied from 6,000-40,000 barrels per day and the daily discharges ranged from 1,000-20,000 barrels per day.

(5) Ship Collisions with Platforms

Commercial vessels can collide with OCS platforms, typically causing substantial damage to both the vessel and the platform. Considering the number of platforms in the Gulf of Mexico and the intensity of shipping traffic, the number of such incidents is surprisingly low. Only two such accidents are reported by USGS (USDI, GS, 1980) from 1969-1979. In August 1975, the GLOBTIK SUN collided with a platform off Louisiana, resulting in damage to both the vessel and the structure. Oil from the GLOBTIK SUN ignited and the tanker caught fire. A collision between a freighter and yet another platform off Louisiana may have contributed to a gas blowout approximately a year later.

The most recent tanker collision occurred on August 21, 1980, when the Texaco NORTH DAKOTA collided with the bottom section of a platform being installed in the Gulf of Mexico by Chevron USA. The collision ripped a hole in the bow of the 565 foot tanker, and the cargo of raw gasoline burned out of control for 36 hours. On August 29, 1980, the ship was pushed free of the platform and towed to port. One crewman sustained minor burns; all others were evacuated from the burning tanker with no injuries.

There is a very small possibility that such an accident will occur as a result of sale-related activities considering the low incidence of ships colliding with platforms in the Gulf of Mexico, the low number of platforms projected as a result of these sales, and the establishment of "shipping safety fairways" in areas of active petroleum development in the Gulf of Mexico.

(6) Tanker and Barge Operations and Accidents

Accidental oil spills from tankers and barges, as well as oil discharged during normal operations, are the largest source of oil spillage from the petroleum industry in OCS waters. Information pertaining to the Gulf of Mexico, obtained through the USCG PIRS data base (USCG, 1980), shows that 3,115 oil spills directly attributed to tanker and barge accidents occurred from 1974-1979. Only 3% of the spills were in excess of 50 barrels, and only 0.6% of the spills were in excess of 1,000 barrels. Although the oil spill rate for tankers versus offshore petroleum production is not much different (Section IV.C.1.c.(2)), the volume of oil handled by tankering in OCS waters is so much greater, that tankering, by far, accounts for the majority of oil spilled in the Gulf of Mexico.

Petroleum residues have been reported to be found widely dispersed over the surface of the ocean in concentration roughly proportional to tanker traffic (Butler, Morris, and Sass, 1973). Analysis of these floating residues seems to indicate that the weathered oil may be derived primarily from tanker discharges (National Academy of Sciences, 1975).

The great bulk of oil outflow from the U.S. tanker fleet in domestic trade originates in operational discharges. The environmental effects of these discharges is much less observable than those from nearshore spills. Operational discharges, if carried out in compliance with all applicable regulations, are dilute and occur at a distance of at least 50 miles from land. Assessing the environmental effects of oil discharges far from land is difficult, and straining to assess the impact of discharges from a subset of tankers when definitive information on the routes followed by these tankers is lacking, compounds the difficulties. Any discussion of impacts should be viewed as preliminary only.

It is obvious that some tar balls on U.S. shores are caused by discharges from domestic tankers carrying crude oil products, as well as from discharges from the international fleet. A study by the Coast Guard (USCG, 1978) recommends that additional measures, in addition to SOLAS 74 and MARPOL 73 pollution prevention measures and tanker safety requirements, be applied to U.S. tank vessels to control oil discharges from possible future transportation of OCS oil to shore.

b. Oil Spill Risk Analysis

The oil spill risk analysis, presented as Appendix D, of the DEIS, provides a quantitative summary of the risks associated with the development and production of OCS resources as a result of these proposed sales. As in the case with any model, it has some limitations and assumptions inherent in its design. Thus, the model is offered as a tool to aid in the decisionmaking process, weighing the associated risks against the benefits of OCS development rather than as a deciding factor in this process.

It is important to understand the assumptions used in the risk analysis, as well as its limitations, prior to interpreting the results. When approached in this manner, review of the data presented in the analysis provides an effective means for risk analysis. The basic assumptions used in the development of the analysis are as follows:

- Large spills are equal to or greater than 1,000 barrels. This figure was used as the cutoff for consideration of historical data as well as for analysis.
- The spill rate (number of spills per volume of oil produced on the OCS or transported in the Gulf) will remain the same in the future. This implies that no benefit is derived from further regulation, supervision, training, and education or the application of new technologies.
- Oil spills are independent of each other.
- Oil spills are instantaneous and are a point mass.
- All tracts offered are leased and all are developed. However, the actual number of tracts leased and/or developed are always less than the number offered.
- Large spills occur with equal likelihood throughout the year which is to say that there are no preferred times for spills to occur. The oil spill model incorporates some 2,000 spill simulations for each spill site (500 per season).
- The distribution of all targets (migration routes, spawning areas, etc.) will remain the same in time and space over the production life of the lease—averaged to be 13 years.
- All targets are sensitive year-round unless otherwise indicated.
- No direct consideration is given to cleanup, dispersion, or weathering processes.
- The portrayal of surface currents in the trajectory analysis represents the circulation expected over the production life of the leases.
- The portrayal of wind characteristics in the model represents the wind characteristics over the production life of the leases.
- The model considers only surface movement of the oil spill.
- Wind data are derived from onshore and offshore sources and inputed as described in the text.
- Oil spills are assumed to originate from two distinct sources—transportation routes (tankers and barges) and OCS offshore petroleum production (platforms and pipelines).

- Spill launch points are evenly distributed along transportation routes and within assumed reservoirs.

- Flow rates are estimated for all transportation routes (pipelines, fairways, etc.). Volumes are estimated for all natural reservoirs. Furthermore, historical data referencing past oil spills are used as input for determining the final probabilities.

- The consequences of slick dispersion are accounted for, in part, through use of land segments. A spill contacting any part of any segment is assumed to contaminate the entire segment for purposes of trajectory analysis.

The results presented in Appendix D of the DEIS are in two forms. Tables 2-10 consider only the probabilities of an oil spill contacting a specific target within 3, 10, and 30 days given that it is launched from the indicated point, undergoes no degradation during travel, and the driving forces are those utilized in the model. These tables are generated under the assumption that all launch points are "oil prone" which is not always the case. It makes no distinction between oil and gas prone areas. The 3, 10, and 30 day distinction comes into play as follows:

The 3-day run is generated on the assumption that most of the immediately toxic fractions of the oil will be evaporated or dissolved within three days. The 10-day run is made assuming that it would take up to ten days to commence cleanup operations. The 30-day run is chosen because most spills are difficult to track after this time since most of the oil spill will have dissipated. Although these time periods implicitly take into account both cleanup and weathering, the probabilities presented in the results do not involve any consideration of cleanup, dispersion, or weathering processes which will determine the quantity and quality of oil that may come in contact with the targets.

The trajectory model (conditional probabilities) deals only with the transport of surface oil by winds and currents. Section IV.C.1.c. discusses the complex array of factors which affect oil spill impacts, and these factors—volumes and duration of spill, weathering phenomena, and oceanographic conditions to name a few—must be regarded by the decisionmaker when interpreting the model's results.

Furthermore, only short-term effects can be accounted for when assessing the Oil Spill Risk Analysis Model impact. In summary, the model can be used as an effective tool to assess environmental impacts by using the trajectory of a slick, likelihood of oil spill occurence, and the components of the environment which might be contacted by the spilled oil. It should be employed to aid in resolving uncertainties, but acknowledging the fundamentally uncertain nature of the estimates produced.

Tables 11-13 in the text of Appendix D (DEIS) and Tables B-1 through B-3 in Appendix B of the Oil Spill Risk Analysis (Appendix D) consider the probabilities of one or more oil spills, the most likely number of spills, and the expected number of spills occurring and contacting land segments over the production life of the leases. They take into account the proposed leases; existing and proposed leases; and the existing, proposed, and transportation combined.

Furthermore, these tables use historical data surrounding oil spill incidences along with the volumes associated with the respective reservoirs and transportation routes as a data base.

The major difference between Tables 2-10, Tables 11-13, and Tables B-1 through B-3 (conditional and final probabilities) is that Tables 2-10 (conditional probabilities) deal only with the trajectory analysis; whereas, Tables 11-13 and Tables B-1 through B-3 (final probabilities) utilize historical data, reservoir size, transportation input from foreign sources, and discern between oil and gas producing fields in the analysis and projects probabilities based on the 13-year average life of the lease area.

The oil spill risk analysis indicates that if the total tracts offered under Sales 67 and 69 are sold and developed, an estimated 0.37 oil spills will result over the average production life of these leases (13 years). This figure does not include potential spills from production from existing leases and from existing waterborne transportation of hydrocarbons. Furthermore, it is estimated that the cumulative effects of production on existing and proposed leases will result in 15.34 oil spills in the study area. The probability of one or more spills greater than 1,000 barrels occurring over the production life of existing and proposed leases is .99+. (See Table IV-6 below which was extracted from the text of the model.)

Table IV-6

Oil Spill Probability Estimates for Spills Greater than 1,000 Barrels
Resulting Over the Entire Lease Life of OCS Lease Sales 67 and 69
from Existing Federal Leases or from Existing Oil Transportation in the
Gulf of Mexico Area

	Expected number of spills (mean)	Most likely number of spills (mode)	Probability of one or more spills
Sales 67 and 69	0.37	0	0.31
Existing leases	14.97	14	0.99+
Sales 67/69 & existing leases	15.34	15	0.99+
Existing transportation (water borne)	23.23	23	0.99+

If we consider the biological and recreational resources and their possible impact resulting from existing leases, we find that Sales 67 and 69 offer little additional risk to these areas. Referring to Table IV-7 (an excerpt from the text) we see that the leases proposed in Sales 67 and 69 offer a .19 probability of one or more spills occurring and contacting any land area within 30 days over the average production life of the leases (13 years). They also indicate that we have more than a .99 probability under the same conditions if we consider the existing and proposed leases.

The high risk areas resulting from the combined production on existing and proposed leases centers around Texas, Louisiana, and Mississippi. The major influences here is not the production associated with the leases offered for Sales 67 and 69 but rather with existing leases and those risks associated with the transportation of oil.

This indicates to the analyst that two major conditions exist which influence these probabilities—the fact that this area is largely oil producing and that there is a significant amount of existing activity in this area. The high risk areas are the Flower Garden Banks; designated preserves; Texas, Louisiana, and Mississippi recreational beaches; historical and archaeological sites; and brown pelican areas. For a more detailed analysis of high risk areas, refer to the Oil Spill Risk Analysis in Appendix D of the DEIS.

c. Environmental Effects of Oil Spills

(1) Generic Types of Impacts

The Oil Spill Risk Analysis Model "targets" special areas and biological resources that have been identified by BLM to be potentially sensitive to oil spillage. The oiling and tarring of beaches is the most easily identified impact and constitutes the most immediately damaging effect of an oil spill. The subsequent change in beach quality creates a socioeconomic and aesthetic impact. Highly damaging effects of spilled petroleum also includes those impacts on seabirds and benthic communities along polluted coastlines. Potential biological damage from crude oil and oil fractions currently being assessed by researchers include the following (Evans and Rice, 1974):

(a) direct kill of organisms through coating and asphyxiation, contact poisoning, or exposure to the water-soluble toxic components of oil at some distance in space and time from the accident;

(b) destruction of the food sources of higher species by modification of the marine ecosystem by diminution of species with an initial decrease in diversity and productivity;

Table IV-7

(Derived from Table 12, Appendix D of the DEIS)

Probabilities (expressed as percent chance) of One or More Spills, the Most Likely Number of Spills (Mode), and the Expected Number of Spills (Mean) Occurring and Contacting Targets Over the Production Life of the Lease Area, Proposed and Existing Leases Only

Target	Within 3 days						Within 10 days						Within 30 days					
	Proposed			Existing and Proposed			Proposed			Existing and Proposed			Proposed			Existing and Proposed		
	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean	Prob	Mode	Mean
Land	6	0	0.1	99	5	5.1	12	0	0.1	**	8	8.9	19	0	0.2	**	12	12.8
Coastal Inlet Areas	2	0	0.0	5	0	0.0	2	0	0.0	10	0	0.1	3	0	0.0	30	0	0.4
Sea Grass Beds	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	1	0	0.0	2	0	0.0
Flower Garden	n	0	0.0	4	0	0.0	n	0	0.0	8	0	0.1	n	0	0.0	28	0	0.3
Env. Preser. Areas	1	0	0.0	36	0	0.4	3	0	0.0	66	1	1.1	5	0	0.1	71	1	1.3
TX Rec. Beaches	n	0	0.0	6	0	0.1	1	0	0.0	16	0	0.2	2	0	0.0	49	0	0.7
LA Rec. Beaches	n	0	0.0	15	0	0.2	n	0	0.0	34	0	0.4	n	0	0.0	35	0	0.4
MI Rec. Beaches	n	0	0.0	n	0	0.0	1	0	0.0	6	0	0.1	2	0	0.0	13	0	0.1
AL Rec. Beaches	2	0	0.0	3	0	0.0	3	0	0.0	4	0	0.0	4	0	0.0	5	0	0.0
FL Rec. Beaches	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Hist./Arch. Sites	3	0	0.0	37	0	0.5	4	0	0.0	58	0	0.9	6	0	0.1	73	1	1.3
Brown Pelican	1	0	0.0	48	0	0.7	3	0	0.0	74	1	1.3	4	0	0.0	78	1	1.5
MI Sandhill Crane	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	1	0	0.0	3	0	0.0
Whooping Crane	n	0	0.0	n	0	0.0	n	0	0.0	1	0	0.0	n	0	0.0	2	0	0.0
Manatee	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Dry Tortugas	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Key West	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Straits of Florida	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0
Yucatan Strait	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0	n	0	0.0

Note: n = less than 0.5% ** = greater than 99.5%

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(c) modification of habitats, delaying or preventing recolonization, in part, due to destruction of the generally more sensitive juvenile forms of organisms;

(d) incorporation of sublethal amounts of oil and oil products into organisms (resulting in reduced resistance to infection and other stresses—the principal cause of death in birds surviving immediate exposure to oil);

(e) incorporation of carcinogenic and potentially mutagenic chemicals into marine organisms; and

(f) low-level effects that may interrupt any numerous events (such as prey location, predator avoidance, mate location or other sexual stimuli, and homing behavior) necessary for the propagation and survival of marine species (Blumer, 1971).

The National Academy of Sciences (1975) summarized the consensus of experts from numerous research and academic institutions throughout the world on the effect of oil on the marine environment as follows: (a) since marine organisms do not tend to retain the hydrocarbons they accumulate when exposed to oil, there is no evidence of food chain magnification of petroleum hydrocarbons in marine organisms; (b) fisheries, particularily adults, do not appear to suffer from oil spills as much as seabirds and benthic organisms; and (c) although information is limited, the effect of oil contamination on human health does not appear to be cause for alarm. The FEIS for OCS Sale 58 includes a discussion of the lethal and sublethal effects of hydrocarbons and trace metals on organisms and communities (USDI, BLM, 1979).

In addition to the biological effects of oil spills, spilled oil can create aesthetic and socioeconomic impacts which include the cost of cleanup and loss of business, fouling of boats and marine structures, creation of a fire hazard. Spilled oil has even been linked to climatological changes due to the effect of spilled oil at the air/sea interface.

Every oil spill incident thus far has been unique. All incidents have greatly aided in the assessment of the ultimate fate of spilled oil. The question of whether low-level, chronic oil input or catastrophic spills are the most deleterious cannot yet be fully determined. Some believe low-level oil pollution can cause subtle changes in organisms and is potentially more dangerous to the ecosystem than dramatic large spills. The cumulative impact or "ecological death" of individual organisms may be quite significant but difficult to assess because the death is not directly linked to an acute oil exposure. However, the evidenced assimilative and dissipative capacity of the ecosystem to petroleum hydrocarbons may lead one to believe that most ecosystems can tolerate some oil pollution and that only when this pollution is at a level where oil cannot be absorbed and metabolized will the ecosystem not tolerate petroleum presence without damage.

Further knowledge of the assimilative capacity of the marine system, weathering processes, and hydrocarbon migration through biological tissue, detritus, and sediment pathways is necessary to better understand the fate of spilled oil in our environment. Considering all the factors, simple toxicity comparisons may be too simplistic an approach in studying the biological damage of oil spills, and caution must be exercised in extrapolating laboratory data to the environment. More detailed long-term studies are needed in more diverse environments, and chemical analysis for hydrocarbons should be coordinated with microbiological studies.

After evaluating the complex set of factors affecting the severity of oil spill impact, the following are identified as times when oil spillage causes the greatest damage and concern (EPA, 1979):

(a) oil is spilled into or reaches a confined shallow body of water (because the volume of oil is large with respect to the amount of water);

(b) the spilled oil is refined, such as home heating oil or diesel fuel (contains more highly toxic compounds, many soluble in water);

(c) storms or heavy surf churn the oil into a "chocolate mousse" (water in oil emulsion, almost impossible to break up);

(d) the spill occurs at a critical season when eggs and larvae of marine organisms are present, (they are sensitive to very low concentrations of water soluble fractions of oil);

(e) crude oil is spilled in an enclosed area where waterfowl are flocking during seasonal migration; and

(f) oil is spilled nearshore.

(2) Factors Affecting the Severity of Oil Spill Impacts

Oil enters the marine environment through many sources. Whether through natural seeps, accidental spills, or long-term, low-level discharges, the presence of oil in the marine environment is, to some extent, unavoidable. About half of the hydrocarbons found in the world's oceans are generated by natural, biological, and chemical reactions. The remainder is introduced into the sea mostly by the action of man—coastal refineries; coastal, municipal, and nonrefinery industrial waste; urban and river runoff; transportation losses; and offshore production. According to the statistics compiled by the National Academy of Sciences (1975) during the years 1968-1971, offshore oil production accounted for only 1.3% of the total petroleum input in the oceans, and although not to imply that these statistics can be applied to the Gulf of Mexico, environmental effects of petroleum contamination seen today cannot, by any means, be directly linked only to offshore oil production. In the Gulf of Mexico, an area heavily utilized by both the foreign and domestic oil industry, statistics compiled from 1964-1979 show that the oil spill risks associated with tanker traffic accounted for 1.94 spills per billion barrels transported, pipelines spilled oil at a rate of 1.82 spills per billion barrels piped, and offshore oil structures accounted for 2.05 spills per billion barrels produced (Devanney and Stewart, 1974) (LaBelle, 1980). These statistics only consider spills greater than 1,000 barrels and are the rates applied to the probabilities generated by the Oil Spill Risk Analysis Model. However, the volume of oil handled by tankering is so much greater than the other two sources that tankering, by far, accounts for the majority of oil spilled in the Gulf of Mexico when considering these three components of the oil industry. In 1979, U.S. imports tankered through the Gulf of Mexico accounted for 81% of the oil handled in the OCS (API, 1980; USDI, GS, 1980a).

Considering all these petroleum inputs into the marine environment, one might expect a greater environmental stress caused from petroleum contamination than researchers are finding in the Gulf of Mexico. BLM is funding comprehensive environmental studies in the Gulf of Mexico to enable the federal government to monitor the potential pollution of the production process. Studies conducted on the topographic features of offshore Texas, Louisiana, and Florida have shown a relatively unpolluted area that has very little, if any, heavy hydrocarbons of anthropogenic origin in bottom sediments, water, or various benthic biota. Sediment samples from the Mississippi/Alabama region have a low level but distinct presence of petroleum. Hydrocarbons in sediments were associated with the Mississippi River influences and, in some instances, platform-related activities; however, no massive contamination of sediments or fauna in the area was observed. The central Gulf of Mexico platform study on the effects of offshore petroleum structures in the Louisiana area found the area contaminated with low-level, multi-source hydrocarbons. The effect of the Mexican Pemex Ixtoc oil spill on the petroleum hydrocarbon levels of the Gulf of Mexico is being assessed presently in a jointly conducted study by NOAA and BLM. (For a full evaluation of the environmental studies program conducted by BLM, see Section I.F.)

The low levels of hydrocarbons found in the Gulf of Mexico are partially a consequence of the dissipative fate of spilled oil on entering the marine environment. In general, the determination of the ultimate impact and the recovery of a system from petroleum contamination depends on the physical and chemical form of the oil and the state of the ecosystem at the specific time of impact. The dispersion of oil in water, its movements, chemical modifications, effects on aquatic organisms, and persistence in the sea are influenced by: (a) type and characteristics of the oil (i.e., density and viscosity); (b) amount and duration of oil spilled; (c) state of the sea; (d) location of the spill which includes the physiography of the area, the distance from shore, and the geographical and topological configuration of the affected coast; (e) weather conditions; (f) biota of the area; (g) season of the spill; (h) previous exposure of the area to oil; (i) exposure to other pollutants; and (j) effectiveness of mitigating measures taken by appropriate federal and state agencies.

(a) Weathering

Spreading and Movement

Spilled oil in the ocean is affected by many physical, chemical, and biological processes. First the spill spreads to form a slick, part of which has a thickness of a few millimeters; however, most has a thickness of about

10^{-4} cm. Surface currents driven by wind, waves, and convectional cells determine the shape and direction of movement of the slick. Under favorable environmental conditions oil slicks tend to break up into patches. These patches are generally connected with the mean current, but they are also subjected to random eddies in the current field which spread the patches over a large area. Surface spreading enhances the other physical and chemical processes—evaporation, dissolution, dispersion, emulsification, and auto-oxidation—operating on the slick.

Evaporation

Evaporation removes the more volatile hydrocarbons from spilled oil. Hydrocarbons containing less than about C_{15} (boiling point $<250^{\circ}C$) will be volatilized from the ocean's surface within ten days (the Oil Spill Risk Analysis Model assumes three days). Evaporation alone will remove about 50% of the hydrocarbons of an "average" crude oil on the ocean's surface (National Academy of Sciences, 1975).

Photochemical Oxidation

Simultaneously, the remaining material is subject to auto-oxidation processes. The thin film of petroleum absorbs ultraviolet light, and activated molecules react readily with oxygen to form more soluble, more surfactant products. The rates of oxidation of hydrocarbons is dependent upon many factors, in particular the oil's chemical composition and the optical density of the oil, especially in the ultraviolet portion of the spectrum. The formation of oxidized products, such as carboxylic or phenolic acids, increases the oil's solubility and may also increase biodegradation and emulsification rates.

Solution and Dispersion

A small amount of the oil slick, in particular the low-molecular-weight hydrocarbons as well as the more polar nonhydrocarbon compounds, may go into solution in the water column. Most of the oil entering the water column is dispersed as fine droplets. This process is governed by the sea state and the wind. Another physical dissipative process, highly dependent upon the sea state, is removal of hydrocarbon via sea spray and bursting bubbles. Tiny droplets containing hydrocarbons may be carried by winds as far as 100 km.

Emulsion Formation

Because most of the components of petroleum are relatively insoluble in water, an important process of dispersion is the formation of emulsions.

In a short time after the spill, the heavier fractions take on a highly viscous consistency caused by the formation of a water-in-oil emulsion termed "mousse" because of its color and consistency. These emulsions containing 30%-80% water are dispersed easily by currents and turbulence at the water surface. Oil-in-water emulsions (around 80% water) are also formed, particularly from heavy asphaltic crudes or residual oils. Naturally occurring surfactants in the petroleum or dispersants added to control spilled oil tend to assist in the formation of emulsions of both kinds.

Sedimentation

Sedimentation of the spilled oil occurs once an increase in density is sufficient to sink the material. Processes increasing density include evaporation and dissolution of the lighter compounds, formation and agglutination of dispersed particles followed by uptake onto particulate sediment, and sorption onto particulate matter such as clay, suspended silt or sand, or skeletal remains or fecal pellets of organisms. In particular, zooplankton fecal pellets have been found to be an important vertical transport agent for hydrocarbons in the open ocean (Carpenter and Fairhall, 1979).

Biodegradation

Throughout the life of spilled oil, biodegradation is an important process in the removal of oil. Many species of bacteria, molds, and yeasts metabolize various hydrocarbons and will increase in number and activity following a spill. The rates of microbial degradation of hydrocarbons in the marine environment depend on the chemical complexity of the oil, oxygen supply, nutrient availability, microbial populations present, and many environmental conditions, particularly ambient temperature and salinity.

Hydrocarbon degradation processes, either chemical or microbial, produce polar compounds with appreciative greater water solubility than original hydrocarbons. Thus, as oxidation products are formed, they are leached out of the oil more rapidly.

The final residue left from these processes will not resemble the original oil in chemistry or in amount. The resulting tarry residue will break up into smaller fragments from continuing wave action and form tar balls. Further degradation, weathering, and interaction with the environment are extremely slow since the surface-to-volume ratio of unspread tar is small. Ingestion by copepods and subsequent excretion will increase the density and aid in sinking the material. Some tar balls reach the coast.

(b) Environmental Parameters Affecting Oil Spill Impact

Both oceanographic and meteorological conditions are important in contributing to the amount of energy needed to drive the complex series of physical, chemical, biological, and geological processes dispersing and dissipating spilled oil. Turbulence affects the physical dispersion and emulsification of oil as well as the availability of oxygen to the biodegraders. Temperature increases accelerate the microbial growth rates, thereby, increasing biodegradation, hasten evaporation of the more volatile petroleum compounds, and lower the viscosity which increases the chance for emulsification. Wave action is not only important in aiding dispersion of spilled oil, but it is important in the removal of stranded oil from fouled shorelines. The amount of turbidity in the water and water surface roughness are significant in determining if the oil sinks. If the water contains suspended sediments or solids, much oil will sink. Sedimentation may be advantageous if intertidal life is abundant, but it may be detrimental to benthic life.

The season of the year is important in determining not only the meteorological conditions but also the severity of the spill's effect in relation to the life cycle of a given organism. Oil spills occurring during seabird nesting times may cause severe mortalities. Spilled oil reaching beaches in July must be considered more deleterious than those that affect the beach in winter.

Other environmental factors to consider include surface tension of water, wave damping, tidal height, current speed, nutrient concentrations, pH and salinity of the water, gas exchange across the air-water interface, and temperature of the spilled oil.

(c) Biological Differences

The severity of oil pollution on different organisms in various habitats varies from no effect to responses of avoidance, decreased activity, or physiological stress. Not only do different species react differently, but different life stages of an organism will show different tolerances to petroleum hydrocarbons. What is toxic to one organism may not be toxic to the next. The concentration of hydrocarbons in marine organisms exposed to oil reflects various levels of uptake, metabolism, storage, and discharge. In general, benthic algae, zooplankton, benthic invertebrates, and fish can depurate hydrocarbons accumulated after exposure to oil. Bivalves, including clams, oysters, and mussels, do not possess the enzyme system, or detoxification system as it is called, and tend to accumulate hydrocarbons (Lee, 1977).

(d) Comparative Toxicity of Different Oil Components

The effect of petroleum on marine organisms is dependent upon its various chemical components at the time of impact. As stated earlier, the relative impact of the oil will shift as spilled oil ages due to the change in its chemical composition. The acutely toxic, volatile chemical components are lost through evaporation and solution during the first days of a spill.

Hydrocarbons in the C_{15}-C_{25} range (boiling point 250-400°C) show limited volatility and will be retained for the most part in the oil slick. Above C_{25} (boiling point >400°C) there will be little loss.

Crude oil is a complex mixture of many different specific hydrocarbons and a variety of compounds containing sulfur, oxygen, nitrogen, and some trace metals. Hydrocarbons make up the bulk of crude oil and can be placed roughly into one of four categories: aliphatic or paraffinic (alkanes), average amount found in petroleum is 15%-35%; cycloparaffinic (cycloalkanes and naphthenes), 30%-50%; asphaltic (asphaltenic and heterocyclic compounds with oxygen, sulfur, or nitrogen), 2%-15%; and aromatic (benzene and polynuclear series), 5%-20%. Due to different geologic and geographic sources, crude oils vary in their composition, density, volatility, and solubility. Their relative toxicity will vary but is roughly proportional to their aromatic content.

Paraffinic (or aliphatic) hydrocarbons are straight or branched carbon chains and are saturated (thus no carbon-carbon double bonds) with hydrogen or other groups. Many parallel, homologous branched-chain alkanes are present, including a series of isoprenoid alkanes. These hydrocarbons are the least toxic, although they may have an anesthetic or narcotic effect if concentrations are great enough.

Although not considered toxic, saturated alkanes are accumulated in higher concentrations than aromatic hydrocarbons in every tissue treatment group tested by Lawler (1978).

During biodegradation of the spilled oil, n-alkanes, being more readily oxidized than other classes of hydrocarbons, are preferentially removed (Zobell, 1973).

Cycloparaffins (naphthenic compounds) contain at least one ring structure that is saturated. With this base, more rings or chains may be attached to form a variety of complex molecules.

Aromatic hydrocarbons include six-carbon unsaturated ring structures such as benzene and a complex mixture of mono-, di-, tri-, and tetraalkyl benzenes, naphthalenes, and polynuclear aromatic hydrocarbons with multiple alkyl substitutions. Benzene, toluene, xylene, and the di-aromatic hydrocarbon naphthalenes are the most immediately toxic petroleum fractions; however, these are the components that are mainly lost by early evaporative and solution processes. Higher-boiling aromatics act as slower poisons than low-boiling aromatics but are equally severe in their effects. In a review of studies by Neff et al. (1976), they found in general that mono-aromatics are the least toxic, acute toxicity increases with increasing molecular size and boiling point until the 4- and 5-ring compounds are reached, and alkylation of the aromatic nucleus seems to increase the toxicity of the parent compound. The most toxic aromatics were phenanthrenes. Some aromatics have been found to be carcinogenic; 3-4 benzopyrene, 1-2 benzanthracene, and some alkylbenzanthracenes have been isolated from crude oil and their carcinogenic effects demonstrated (Blumer, 1971). The polynuclear aromatic hydrocarbons (PAH's) exhibit very low solubilities and generally are most resistant to weathering processes. PAH's and light absorbing nitrogen, sulfur, and oxygen compounds, as well as most of the heavy metals, will tend to remain in the tarry residue.

In evaluating the oil spill model, therefore, it is important to keep in mind not only how much oil would probably reach land in 30 days after weathering processes but also the chemistry of the oil that would be impacting the coastline.

(e) Comparative Toxicity of Different Oil Forms in Water

Although toxicity tests show that the deleterious effects of oil are related to its chemical components, many results suggest that the form of oil at sea is just, if not more, as important in determining toxicity. That portion of the oil that dissolves, the water soluble fraction (WSF), appears to be the most highly toxic to organisms which is possibly due to the easier uptake of oil in this form (Ottway, 1976; Winters and Parker, 1977); Ottway (1976) examined the effect of water-in-oil emulsions (mousse) and oil-in-water emulsions. She found that mousse was more stable to degradation than oil-in-water emulsions and that, in general, it appears that water-in-oil emulsions are likely to cause biological damage by physical effects, while oil-in-water emulsions probably cause more biological damage by toxic effects. Oil in dispersed droplets exhibits slightly less toxicity than the WSF's. Therefore, although the PAH's of spilled oil are the least degraded in oil and show high toxicity in laboratory tests, the relative toxicity of the lower boiling aromatics may be more important due to their enrichment in the aqueous phase, specifically the naphthalene hydrocarbons.

(f) Comparative Toxicity of Oil Types

Toxicities vary between oils because the concentration and composition of individual hydrocarbons within the oil vary. In general, refined oils are considered more toxic than crude oils due to their high aromatic hydrocarbon concentrations and their greater ability to mix into the water column due to their less viscous nature. In general, spills of crude oils, residual fuel, and lubricating oils are more likely to cause biological damage by virtue of their viscous physical properties when considered over a length of time, while spills of refined oil, including gasolines and kerosenes, are likely to cause biological damage by virtue of their toxic nature over a relatively short period of time (Ottway, 1976).

(g) Location of Spill

One of the most important factors to assess in determining oil spill impact is the ability of spilled oil to reach shoreline. The most harmful effect of an oil spill occurs once the slick reaches its ultimate destination—land. The effects must be determined in light of the kind of habitat it may impact—intertidal areas; subtidal substrates; rocky, sandy substrates; marshlands; or offshore sediments.

Oil is transported to bottom sediments by vertical transport of the oil through absorption on suspended matter or fecal pellets. Depending on wave action, oil spills in the open oceans have less chance of reaching the ocean floor than those occurring in shallower waters.

Little is known concerning the effects of sediment-associated oil on organisms and ecosystems. Sediment-absorbed oil may be slowly released to the adjacent water column by physical and chemical mechanisms. In some anoxic sediments, hydrocarbons were still present seven years after a spill (Butler and Levy, 1978). The sediment type is important in determining incorporation of the oil; fine-grained, highly organic sediments absorb more oil than sandy substrates (Ayers, 1978).

Oil impacting high energy beaches may be cleaned by wave turbulence or wind action, and the oil may be dissipated by deeper penetration into the sands. Beach detritus, such as oiled kelp, wood, or trash, will probably show the evidence of a spill for the longest time. In sheltered, low-energy areas the oil may be embedded in the sediments and persist for years. In estuaries and protected areas, the rate of change of the oil is much slower and confined to the aging and hardening of the oil by air exposure. As a result, stress from surface coating is increased in low-energy areas and may affect some organisms. In general, intertidal and estuarine organisms exist in a fluctuating habitat and are thus hardier to the stresses that may result from oil contamination than organisms living in a constant environment. The organism's ability to adapt to new environmental conditions and the determination of an organism's stress periods are important parameters to consider when evaluating the impact of petroleum (Laughlin and Neff, 1977; Tatem et al., 1978).

d. Gas Blowouts

According to information compiled concerning OCS oil and gas related accidents in the Gulf of Mexico (USDI, GS, 1979), a total of 76 gas blowouts occurred during the period of June 1956-July 1979. Nine of these incidents were associated with spills of oil or gas condensate, and fourteen blowouts resulted in fire. Fifteen of these blowouts resulted in total or near-total loss of the rig or platform. Six blowouts resulted from damages incurred during passages of hurricanes or major storms, and two resulted from collisions with ships, although in one of the latter cases the blowout occurred a year after the collision had occurred. Two recent blowouts of interest because of their threat to biological communities at the Flower Garden Banks are briefly discussed in Section IV.D.1.a.(1) (p. 146 of the DEIS). These blowouts include one (1980) of minor environmental damage which resulted when gas blew out through the casing, resulting in a small amount of drilling mud being discharged into the marine environment. The other blowout (1976) occurred when gas blew out around the casing, resulting in a large crater on the seafloor. The first-mentioned blowout resulted in several fatalities, numerous injuries, and major damage to the platform; the latter resulted in a total loss of the platform, but no fatalities or injuries.

Previous analysis (USDI, BLM, 1979) has assumed a blowout rate of one blowout per 245 wells drilled based on historical information from the Gulf of Mexico. A more recent analysis (Danenberger, 1980) corroborates this blowout rate. Based on the 8-year period of 1971-1978, the blowout rate was one blowout per 250 wells drilled. The total number of wells (mean value) predicted as a result of Sales 67 and 69 is 690 wells, including both exploratory and development wells. Of the 472 tracts proposed for these sales, 326 (about 69%) are gas or oil/gas prone. If we assume that 69% of the wells drilled are on these gas or oil/gas prone tracts, we can project that three gas well blowouts will occur over the 30-year life of production.

Environmental consequences of gas blowouts are negligible. Even if a release of gas condensate occurs with the blowout, the impact would be minimal. Gas condensate is very volatile and evaporates at a rapid rate.

e. Potential Accidents Contributed to by Geohazards and Deepwater Development

The geologic conditions described in Section III.A.2. of this document can cause structural failures or drilling accidents resulting in oil spills, property damage, and injury and/or loss of life. Damage to the environment may result. The extent of any damage would depend on the nature of the accident and the amount of oil spilled.

Although accidents occur in the Gulf of Mexico, most potential geological hazards can be mitigated through engineering and drilling program modifications such as predrilling geophysical surveys and foundation soil analysis.

No accidents in deepwater operations have occurred to date which have resulted in environmental damage. No deepwater hydrocarbon discoveries have occurred to date.

Most potential threats to the environment resulting from deepwater operations can be mitigated through proper design, procedures, and training in the drilling program.

2. Impact Producing Factors Resulting from Routine Offshore Activities

a. Drilling Muds and Fluids

Drilling fluids, commonly called "muds," perform a variety of functions in drilling a well such as cooling the drill bit, maintaining downhole pressure, and bringing cuttings (the rock being drilled through) to the surface. For detailed descriptions of the use of muds, see Appendix E of the FEIS for Sale 65 and Offshore Operators Committee (1976).

Drilling operations are basically the same regardless of mobile rig type (jack-up drilling rigs, drillships, and semisubmersibles). Initially, a drive casing is installed along with a blowout preventer. The casing is either jetted into place or driven into the bottom with a pile drive. Drill mud is circulated through the drill stem and casing to contain subsurface pressures and remove rock cuttings. Cuttings are washed and discharged overboard where they settle to the bottom. Some mud remains attached to the cuttings when they are discharged. As the cuttings cascade down through the water column, the mud is washed free and creates a turbid plume trailing with the prevailing surface current.

Otteman (1976) has considered the problem of drill cuttings and muds which result from offshore drilling and has presented the following analysis which is based upon experience in the Gulf of Mexico.

> The first 150+ feet will be drilled or jetted with seawater. The resulting seawater mud will be returned directly to the seafloor without being pumped to the rig. While drilling the hole to 1,000 feet, typically only seawater will be used as drilling fluid; and it will be discharged overboard. When the formation clays do not make a viscous enough mud, some natural bentonitic clay will be added to the system. The discharged water amounts to approximately 7,000 barrels (for a typical 10,000 foot well), and it will contain mostly natural mud generated while drilling the hole. Before running the conductor pipe to 1,000 feet, approximately six tons of bentonite clay will be added to the 1,000-barrel saltwater system. When the conductor pipe is cemented, this volume of bentonite clay in seawater will be discharged overboard.
>
> While drilling the remainder of the hole, the mud is continuously cycled back through the mud system. Some mud is discharged with the drill cuttings; and periodically, drilling mud is discharged overboard to make room for natural mud made while drilling the hole. The maximum discharge will not exceed 200 barrels a day while drilling to 5,000 feet and 50 barrels a day from 5,000-10,000 feet. During approximately 20 days of drilling to 10,000 feet, some 2,000 barrels of bentonite clay and lignosulfonate treated mud would be discharged overboard. We would possibly begin converting the mud system from a seawater gel mud to a lignosulfonate treated freshwater mud at around 6,000 feet. This decision would be based on the relative economics of hauling freshwater from shore versus the higher maintenance cost of saltwater muds. During the additional 70 days operations while drilling from 10,000-18,000 feet, the discharge rate will not exceed 50 barrels a day; approximately 4,000 barrels of lignosulfonate drilling mud would be dumped overboard. When the well is completed, the mud remaining in the surface system is discharged overboard; this can amount to as much as 800 barrels.

Most of the wells drilled as a result of this proposal should be approximately 10,000 feet in depth. Using this depth as an "average," we can estimate total volumes of muds and cuttings discharged as follows: (1) exploration, 225 wells, 114,975 yd^3 of cuttings, 1,023,050 barrels of muds; and (2) development and delineation, 445 wells, 227,395 yd^3 of cuttings, 2,024,750 barrels of mud. This sounds like, and indeed is, a great deal of material, but it must be kept in mind that these amounts will be discharged into a very large body of water in which dilution and dispersion is rapid and such a discharge will be over a period of several years. Furthermore, the estimates assume full production which may not be realized.

There is some concern regarding the environmental impacts of these drilling muds and cuttings. A great deal of effort and money has been expended, and is continuing to be expended, in trying to resolve this problem. The latest attempt was a 3½ day symposium on Research on Environmental Fate and Effects of Drilling Fluids and Cuttings held in Orlando, Florida, on January 21-24, 1980. The proceedings of the symposium are now available (Symposium, 1980). Over 350 scientists, industry representatives, environmental group representatives, and representatives of federal, state, and local governments attended. It is the judgment of the biologists of the New Orleans OCS Office, BLM, based on that symposium and numerous reports of government and industry sponsored research, that two positive statements can be made: (1) many muds used in normal offshore drilling operations do indeed contain materials toxic to marine organisms, but only at concentrations four or five orders of magnitude higher than those found more than a few meters from the discharge point; and (2) dilution is extremely rapid in offshore waters to the extent that every substance measured in the water column, including turbidity, is at background certainly at a distance of 2,000 m, and probably within 1,000 m. In another study performed for Exxon, drilling fluids were discharged into Gulf waters at a high rate. The study (Ecomar Inc., 1980) came to the following conclusions:

> Due to settling and dilution, suspended solids levels and metal concentrations drop quickly with distance near the discharge source. Concentrations decreases of three to four orders of magnitude occur within 100 m downcurrent of the discharge source. Concentrations continue to fall, but at a slower rate, as the plume moves further away. Concentration decreases of five to six orders of magnitude occur at distances of 500-1,000 m. Soluble component concentration decreases were estimated to be some two orders of magnitude less than those observed for the suspended solids.
>
> The transport time required for suspended solids concentrations to reach background levels was found to be an increasing function of rate. The relationship appears to be a simple power law function. This correlation does not seem to be strongly influenced by other discharge conditions and may be used with ocean current data to estimate distance where discharged solids will reach background levels.
>
> Because of the rapid decrease in suspended solids and metal tracer concentrations with distance and the temporary effect that the discharges have on seawater hydrography (transmittance only), it is concluded that drilling fluids have a negligible effect on open-ocean water quality during high rate, high volume discharges.

Concern has been expressed that while the capacity of the sea to dilute various pollutants is enormous, it is not limitless. This is certainly true, but while the volumes of muds and cuttings discharged into the ocean may seem quite large, it might be instructive to compare such discharges with other contributions to the world's oceans. Using figures given above, those of Offshore Operators Committee (1976), and assuming an average well depth of 10,000 feet, each well will discharge about 1,000 tons of solids in muds (assuming an average mud weight of 10 lbs/gal, which is probably high). Thus, during the 5-10 years it will take to conduct all the exploratory and development drilling for this proposal (again assuming discoveries and production), the mean of the range of wells estimated to be drilled is 670 wells, discharging about 670,000 tons of muds solids into the ocean. Yet in a single year the world's rivers contribute an estimated 20 billion tons of sediment; the Mississippi River alone dumps 344,000,000 tons of sediments into the marine environment each year. Furthermore, some 91,800,000 tons of dredge spoils were disposed of in marine waters in 1979 (Letzkus, 1980). So, assuming full development in ten years from this proposal, an average of 67,000 tons of muds solids a year will be discharged; this is .003% of solids contributed by rivers, .02% of that contributed by the Mississippi River, and .07% of that contributed by disposal of dredge spoils. This is indeed an insignificant amount which becomes lost in the noise of the major contributions.

The stipulation discussed in Section I.C.2.b. is designed to provide an assessment of any impacts in appropriate cases, and BLM, EPA, and NOAA are continuing to fund extensive research programs both in the field and in the laboratory. More information is needed on how to fund extensive research programs both in the field and in the laboratory, as well as how points 1 and 2 above interact. We believe, however, that points 1 and 2 above do allow us to state that drilling operations on the OCS can proceed as presently anticipated provided that the biological stipulation is adhered to and that as new information becomes available, stipulations and operating procedures are modified accordingly. It is the contention of BLM that the biological stipulation, as contained herein, reflects this proviso.

b. Formation Waters

Formation water, also called produced water, is the liquid associated with the extracted oil and gas and must be removed and disposed of. Produced water is relict seawater but with anomalous ion ratios.

The following discussion of produced water is taken largely from Koons, et al. (Offshore Operators Committee, 1975).

> Produced waters generally contain appreciable concentrations of dissolved inorganic salts in which the principal cations are sodium, magnesium, and calcium. The principal anions are chloride, sulfate, carbonate, and bicarbonate. The concentrations of total dissolved constituents can vary over a wide range from a few milligrams per liter to as much as 350,000 mg/l. Collins (1974, 1975) reviewed the composition of many oil field waters and found that the majority contained high chloride concentrations. Hydrocarbons and some organic compounds may be present in produced waters at part per million levels. Dissolved oxygen may be present at low concentration in produced waters.

A recent study of the Buccaneer oil field offshore (USDC, NMFS, 1977) reported that produced water was discharged at a rate of 138 m^3 per day between January 1975-February 1976. The average oil content of this produced water was 25.1 ppm. Near-platform macrobenthic populations were depressed and had a high turnover rate as compared to the surrounding sea bottom; however, no cause-effect relationship was established.

OCS Order No. 7 requires that all discharges must meet EPA standards which allow no more than 72 mg/l daily maximum of oil and grease discharge and 48 mg/l maximum monthly average (72 mg/l is equivalent to 52 ppm).

Typical sodium concentrations range from 23,000-57,000 mg/l. Typical calcium concentrations are between 2,500-25,800 mg/l and those for magnesium are from 100-5,000 mg/l. There are occasional waters in which values either much higher or lower than the averages are observed.

It is important to note that the metal ions present in the highest concentrations are those which are common either to seawater or many terrestial deposits and are not considered hazardous at the low concentrations observed except very close to the discharge. Those metals generally considered as toxic are present at very low concentrations, often below the level of detection of even the sensitive methods used. The metals which would be of greatest concern in the environment are those which are toxic in concentrations of parts per million or less. To consider any possible hazards in discharging produced waters containing toxic metals into the marine environment, it is necessary to consider the following three factors:

(1) concentration of trace metals in produced waters;
(2) concentration of trace metals in normal seawater; and
(3) toxicity levels of toxic metals.

With the exception of Cu, Cr, Mn, and Sr, the concentration of trace metals in produced waters is not much different from that found normally in seawater.

The six most toxic elements for marine organisms are considered to be mercury (Hg), cadmium (Cd), silver (Ag), nickel (Ni), selenium (Se), and lead (Pb). Produced waters do not normally contain concentrations of these six elements greater than those found in seawater. Recently, attention has been paid to the determination of the two most toxic elements (Hg and Cd) in effluents from a number of crude oil offshore production units. In essentially all samples examined, values were below the levels of detection which were 50 parts per billion for Cd and 0.5 parts per billion for Hg. Of lower toxicity, but still of concern, are copper (Cu), chromiun (Cr), arsenic (As), zinc (Zn), and manganese (Mn). There seems to be no damage caused by the low levels at which these trace elements are present in produced waters.

A number of natural processes, such as chelation and absorption among others, operate to reduce both the concentrations and toxicity of trace metals dissolved in water. In order for a heavy metal to be toxic, it apparently must be in the ionic state. In most natural waters much of the free metal ions would probably be bound to organic substances naturally present in the water, decreasing the relative percentage of the ionic species. There is indirect evidence that organically chelated heavy metals in aqueous solutions do not have as great an effect upon organisms as do solutions of the metal salts. This could be due either to the fact that the organometallic complex is too bulky to enter a biological system or to the lack of availability of the metal for reaction with enzymes within the cells.

In addition to the possible environmental effects of trace elements in offshore produced waters, there are some additional components and properties of produced waters which have a potential for minor environmental effects. These are salinity, dissolved oxygen, organic compounds other than hydrocarbons, and temperature.

Salinity

Many offshore produced waters have higher concentrations of dissolved solids than the waters surrounding the platforms. The average total dissolved solids content for produced formation waters from offshore Louisiana production facilities is approximately 110,000 mg/l (ppm), compared with 35,000 mg/l for normal seawater. Since we are dealing with dissolved components, dilution occurs quite rapidly when the produced waters are discharged into the waters surrounding the platform. Any environmental effects will be extremely localized near the point of discharge. Mackin (1973) states, "This dilution in large water bodies and comparatively deep water is almost instantaneous, and dilutions of 1,000 parts of seawater to one of brine can be effected in even comparatively shallow water in distances of from 8-50 feet. In offshore waters in the Gulf or elsewhere, there is no brine problem for that reason."

Salinity measurements were made at 180 different sampling stations offshore and in Timbalier Bay, Louisiana (GURC, 1974). Variations could be correlated with season and geography of sampling sites and all variations were within the ranges reported by season.

Dissolved Oxygen

Since oxygen is also a dissolved molecular species, the above comments about dilution apply here as well. Also, the GURC (1974) study found that natural processes (tides, floods, droughts, etc.) completely overshadowed any changes in dissolved oxygen content which might have been caused by the discharge of production waters. No significant depletion of oxygen was observed at platform sites and what small reduction was noted could be explained by the generally rich biota living on the platform legs.

Organic Compounds Other than Hydrocarbons

Other organics found in platform production waters will usually be present in even lower concentrations than the petroleum hydrocarbons associated with these waters. These other organics would likely be in the low ppm range, and dilution would rapidly disperse them below the limits of any adverse environmental effects.

In the GURC study, measurements were made of the organic carbon content in the waters around two producing platforms and a control area some six miles away. Typical organic carbon contents measured around the platforms were 5.8 and 5.0 mg/l (ppm), respectively, and 5.1 mg/l (ppm) for the control area. Since these values are all within the sampling variability, it was indicated that there was no significant buildup of organic compounds in the vicinity of the producing platforms.

Temperatures

Production waters tend to be somewhat warmer than the water surrounding the platforms, but here again, the differences are not likely to be great. As with dissolved organics, dilution would almost instantaneously diminish any temperature gradients. In the GURC study, temperature measurements were also made at some 180 different sampling stations offshore and in Timbalier Bay. As was found with salinity, the temperature variations correlated with season and nearness to shore, and no impact of the platforms and their discharges on the water temperature was noted.

Radionuclides

Naturally occurring radionuclides are found in formation waters at higher levels than are found in open seawater, but these seem to not be a hazard for the offshore environment.

Values range from approximately 40-1,000 pCi/l. Geothermal brines range from approximately 40-1,000 pCi/l for radium-226 and 40-500 for radium-228. In contrast, salt dome brines produced by the Strategic Petroleum Reserve Project are very low in radium-226, ranging from 0.4-3.1 pCi/l in samples analyzed. The sources of radionuclides in formation waters are naturally occurring minerals in shales and sandstones. Radium in freshwater sources is typically bound to suspended particles but desorbs into solution when exposed to saltwater as the freshwater enters estuaries or bays.

Despite the higher levels in formation water as compared to open seawater, there seems to be no apparent human health or environmental contamination problem because of the rapid dilution of these formation waters when discharged offshore. On land, formation waters are typically reinjected or disposed of down disposal wells. There are some instances of discharges into coastal marshes, however, which might allow accumulation of these materials in sediments or biota. The only apparent problem at present is one of regulation; proposed EPA regulations would classify normal formation waters as a "hazardous waste" because of the levels of radionuclides which occur naturally and would prohibit their release into the environment.

c. Air Emissions

The air quality of control areas of the Gulf of Mexico varies widely from area to area depending on the extent of both metropolitan and industrial development. Recently, concern has been focused on offshore development as making a contribution to onshore problems as well as to local offshore air quality. As a result, legislation was passed to control and limit the output of emissions offshore. Reference is made to 30 CFR Part 250 effective June 2, 1980. These regulations set exemption limits for air emissions on all new offshore facilities as well as allowing review of existing facilities. These regulations further allow review of existing or proposed facilities otherwise exempt to determine and control the cumulative effect of air emissions by all facilities in the area.

As a result of the regulation set forth in 30 CFR Part 250, it is highly unlikely that air emissions from offshore facilities related to oil and gas exploration and development would ever pose serious threats to onshore air quality simply due to the control that regulators now have over these operations. This does not, however, mean that offshore activities will not impact onshore air quality. The degree of impact is a function of the type and amount of offshore emission, distance from shore, existing onshore conditions, and climatic conditions.

Onshore air emissions, as a result of the proposed sales, would have a negligible effect. All onshore operations will be required to meet all federal, state, and local air quality standards. These activities will be subject to all permit requirements and will be required to comply with all onshore operating conditions. These sales are expected to result in the use of existing refineries and gas production plants in all Gulf states. They may, however, result in new gas processing facilities on the northeast Gulf coast.

Offshore air emissions resulting from OCS oil and gas exploration and development operation are via combustion and evaporation. The main constituents of OCS emissions are volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur dioxides (SO_2), total suspended particles (TSP), and carbon monoxide (CO). Simply stated, 30 CFR Part 250 sets exemption limits by use of the following formulas:

$E = 3400\, d^{2/3}$ For CO
$E = 33.3\, D$ For TSP, SO_2, NO_x and VOC
where
E is emission exemption in tons/year
D is distance of the facility from closest onshore area of a state (statute miles)

Note that exemption levels are dependent upon distances offshore. As can be seen, the impact of OCS activities on air quality is variable.

Another important consideration in assessing this impact is the attainment status of all Gulf coast areas to the National Ambient Air Quality Standards. It is understandable that OCS activities could possibly further compound problems of coastal nonattainment areas if significant emissions were produced close to that area. Or, in areas of attainment, OCS activities could produce no noticeable effects on onshore areas.

It should also be noted that the Breton Williams Area in Louisiana and the Everglades National Park in Florida are PSD Class I areas (Prevention of Significant Deterioration). Refer to the National Ambient Air Quality Standards which states attainment status.

The following table presents estimated emission factors from actual Plans of Exploration (SO 2974-3223 and SO 2974-3170) for comparison. Information is not available at the present time to determine whether these figures are typical or atypical; however, they do provide a base for comparison. Note that ranges rather than single sets of numbers are shown to reflect the variability between projects.

Emission	Projected Emission tons/yr
CO	10-28
SO_2	2-8
TSP	1-4
NO_x	41-112
VOC	1-5

As discussed previously, these levels would normally be compared in reality to exemption formulas in 30 CFR Part 250 for compliance. In both plans from which these data were extracted, the expected emissions were significantly low as compared to their respective exemption levels. Further, limited research indicates that this is normally the case. Thus, the only significant effect of OCS activity is normally the cumulative effect of all activity in the area. This is regulated, as stated previously, by authority under 30 CFR Part 250.

Along the northern Gulf coast, there are a significant number of areas which are closed as having nonattainment status for one or more compounds. Considering the tracts offered for lease in Sales 67 and 69, this in general does not present the risk of significant impact because the tracts are widespread and relatively distant from shore. There are, however, some groups of tracts close inshore and/or near nonattainment areas. The most significant groups are listed below by sale.

Sale 67	Sale 69
4-5	1-16
17-25	121-131
41-43	
52-54	
62-66	
77-84	
106-126	

These areas would undergo the same review upon submission of exploration or development plans as other facilities under 30 CFR Part 250 as to their exemption levels and proximity to nonattainment areas and cumulative effect of emission. Due to the levels of emissions produced during OCS operations, it is possible, but unlikely, that controls would be enforced on air emissions in these areas.

d. Wastewater Contaminants and Solid Wastes

Wastewater resulting from offshore activities include deck drainage, sanitary wastes, domestic wastes, cooling water, and desalinization unit discharges. Solid wastes include sanitary and domestic wastes. Deck drainage is all waste resulting from platform washings, deck washings, tank cleaning operations, and runoff from curbs and gutters, including drip pans and work areas. Sanitary wastes are personnel wastes from toilets and urinals. Domestic wastes are materials discharged from sinks, showers, laundries, and galleys. Cooling water is defined by EPA as "noncontact" water used for cooling machinery, and desalinization discharges are those wastes resulting from creation of freshwater from seawater.

All these discharges are regulated by EPA through the National Pollutant Discharge Elimination System (NPDES). Final general NPDES permits for oil and gas operations in specified nonsensitive areas of the Gulf of Mexico have been issued by EPA (46 FR 20284; published April 3, 1981). Certain lease blocks or lease areas containing potentially productive or unique biological communities are specifically excluded from these final general permits. These excluded blocks or areas are listed in the *Federal Register* notice and will require individual NPDES permits for oil and gas operations.

The final general permits set forth certain effluent limitations and monitoring and reporting requirements. Briefly, these are: (1) Volumes of drilling fluids, drill cuttings, and deck drainage must be estimated and reported, and these discharges must result in "no discharge of free oil," meaning that the discharge must not result in a film or sheen on the water surface; there must be no discoloration of the water, and there must be no discoloration, sludge, or emulsion deposited on shore or on benthic sediments. Oil-based drilling fluids and halogenated phenol compounds may not be discharged. (2) Volumes of produced waters, produced sands, and well-treatment fluids must be estimated and reported. Produced water discharged must not exceed daily maximum concentrations of 72 mg/l oil and grease. (3) Sanitary wastes discharged from platforms manned by ten or more persons must be chlorinated, with the concentration of residual chlorine maintained as close as possible to 1.0 mg/l; discharges from platforms manned by nine or fewer persons, or only intermittently manned by any number of persons, need only be treated so as to avoid floating solids as a result of these discharges. Any facility using a marine sanitation device in compliance with Section 312 of the Clean Water Act is acceptable. (4) There shall be no discharge of floating solids or visible foam in other than trace amounts. Domestic wastes need only be physically macerated to avoid floating solids on discharge. (5) Discharges of surfactants, dispersants, and detergents shall be minimized except as necessary for compliance with safety requirements of the Occupational Health and Safety Administration and USGS.

Impacts on the water quality of receiving waters of discharges meeting these requirements will be minimal, and are expected to be confined to an area within a few meters of the discharge site.

Estimates of typical volumes of sanitary and domestic wastes of offshore facilities have been developed by EPA (1976) and are tabulated below:

TYPICAL RAW COMBINED SANITARY AND DOMESTIC
WASTES FROM OFFSHORE FACILITIES

Number of Inhabitants	Flow gal/day	BOD, mg/1		Suspended Solids, mg/1		Total Coliform (x 10)
		Average	Range	Average	Range	
76	5,500	460	270-770	195	14-543	10-180
66	1,060	875	–	1,025	–	–
67	1,875	460	–	620	–	–
42	2,155	255	–	220	–	–
10-40	2,900	920	–	–	–	–

e. Drilling Rig and Platform Emplacement

Estimates are that as many as 450 exploration wells and 450 delineation wells might be drilled as result of these combined sales. Likewise, the installation of as many as 65 platforms and 7 subsea completions might result from these combined sales (Table IV-1).

Rig and platform emplacement will result in disruption and suspension of sediments only in the immediate vicinity of the site. Displaced material or the physical presence of the rig or platform can smother burrowing and attached benthos. Increased turbidity resulting from rig and platform emplacement can temporarily clog the respiratory organs of many marine organisms and the filter-feeding mechanisms of numerous others. This increased turbidity is a short-term phenomenon, and generally is not significant beyond a few hundred meters from the site of the rig, platform, or associated anchors.

f. Pipeline Emplacement and Physical Presence

Transportation of products produced from an area may require the installation of large diameter (61-91 cm) pipelines. Present OCS operating regulations require pipeline burial in water depths less than 200 feet. Present requirements for granting BLM right-of-way permits stipulate burial to a depth of 3 feet where the overlying water depth is 200 feet or less in order to afford greater stability in shallow waters during storms. Gathering lines from clustered rigs or proximate fields do not have this requirement. However, because they are small diameter lines they tend to sink into the sediments. During pipeline burial a large volume of bottom sediments are disrupted and suspended in the water for a short period of time. In general, the environmental impacts of pipeline burial are very similar to those of discharges of drill cuttings and drilling muds.

— Dredging in nearshore areas will often result in resuspension of many years' accumulation of such materials as organic matter, phosphates, and other nutrients, as well as toxic heavy metals and pesticides, if present.

— On hard bottoms, dredging will eliminate suitable sites for attachment of the biotic communities dependent upon hard substrate attachment (sponges, soft and hard corals, seaweeds, and sessile molluscs). This impact will persist throughout the pipeline burial path either permanently or until the substrate gradually becomes recompacted.

— Displaced material can smother the burrowing and attached benthos. This can occur where these materials settle to the bottom and accumulate to significant depths.

— Increased turbidity in all locations where these activities occur. The small-sized particles causing this turbidity can temporarily clog the respiratory organs of many marine organisms and the filter-feeding mechanisms of numerous others. This increased turbidity is a short-term phenomenon, and generally, is not significant beyond a few hundred meters of the dredge site.

— In coastal wetlands, pipeline burial operations could displace many species of wildlife during construction and maintenance operations. The effects of pipeline burial in wetlands can have a substantial impact for a duration of one to several years as a result of devegetation and disruption of substrate. An additional potentially significant impact of pipeline burial in coastal estuaries can result from disruption of water circulation patterns.

— Emplacement can also cause physical damage to unknown cultural artifacts and sites (e.g., shipwrecks and human habitation sites).

The physical presence of pipelines resulting from these sales would have negligible impacts on the

g. Physical Presence of Drilling Rigs, Platforms, Boats, and Barges

The exploration, development, and production of OCS resources consist of many phases of activity including the initial survey with medium to small size vessels, the placement of exploratory rigs, support from local bases utilizing crew and work boats, placement of platforms for long-term use, and the use of barges and work boats in support of production activities. All these activities affect their surroundings merely due to their presence in the area.

An increase in ship or boat traffic in an area may or may not have an impact on the area depending on existing conditions. It is possible, however, that any increase in vessel traffic could pose additional transportation safety hazards in an area heavily traveled or particularly difficult to navigate. If existing port and supply facilities are to be used, and this is the assumption regarding activities resulting from these sales, increased usage may affect their adequacy to meet all commercial needs. Additional concern might be the occurrence of vessel traffic in constricted waterways such as bays, rivers, inlets, and sounds where the Florida manatee occurs (Section II.A.2.b.).

The presence of offshore rigs and platforms occasionally conflicts with commercial and sport fishing interest for space. However, this is often offset by the fish attracting capabilities of the structures. Commercial fishing would be most affected by the presence of offshore structures due to the nature and method of its activities. If a rig is placed in productive fishing grounds, commercial fishermen would assume the burden of safe navigation around these obstacles without entangling their gear.

All platforms and rigs are obstacles to local navigation. It is fortunate, however, that these structures are quite visible to mariners due to their size and lighting. One of the most pronounced factors regarding OCS activities is the visual impact these operations have on the surrounding area. The majority of lease tracts offered are far offshore where they do not interfere with the aesthetic value of the coastal areas. However, some tracts are being offered that are at or just beyond the 3-mile coastal limit. OCS operations in these areas may impact the visual value of the surrounding area. The following table summarizes estimates of activities assumed to result from these sales. Listings are broken down in four major subregions.

Table IV-8

Estimates of Assumed OCS Activities from Sales 67/69

	Texas	Louisiana	Upper Gulf	Florida Shelf
Estimated number of rigs during any given year of field life				
A. Exploration	3-5	5-10	1-2	2-5
B. Development	1-3	1-3	1	1-2
Cumulative number of platforms during any given year of field life	1-9	2-18	1-3	1-4
Number of existing temporary bases utilized during exploration	1-6	2-10	1-2	1-4
Number of existing operation bases utilized during development and production	1-6	1-12	1-2	1-3
Estimated number of pipeline miles constructed during the life of the field	75	150	25	35
Estimated busiest year	1984-85	1983-84	1985-86	1984-85

Source: BLM, 1980.

h. Platform Removal

Lease termination, the final step in the OCS leasing process, occurs when commercial production is no longer feasible. Current regulations (43 CFR 3320.1, OCS Order No. 3, and on OCS lease form condition) require removal of all structures, equipment, and improvements from the former lease within one year of the official termination date. All casing, wellhead equipment, and piling are removed to a depth of five meters (16 feet) below the ocean floor, and the lessee must verify that the lease site has been cleared of all obstructions.

The largest and most obvious production-related equipment on a lease site above and below the water is the steel production platform. A basic platform normally consists of a large support structure known as a jacket which is firmly anchored in the seafloor and extends vertically throughout the water column and supports a superstructure above the water from one to three decks and a heliport. Superstructures are often reusable at other production sites; however, platform jackets are seldom suitable for reuse and are therefore discarded or recycled as raw material.

Production platforms may remain on a lease for as long as 30 years before production is terminated. OCS development and production began about 25 years ago. Therefore, an increasing number of nonproducing structures are likely to be removed in the coming years. In the last few years, an average of 30-40 platforms per year have been removed from the OCS. There are currently about 3,500 oil and gas production platforms in the Gulf of Mexico of which 2,500 are on the OCS. Most of these structures are located off the coast of Louisiana and southeast Texas.

Platform removals involve the use of giant derrick barges, transport barges, several tug boats, and commercial divers. Actual removals can take several weeks at a cost of millions of dollars.

A rich, diversified marine community becomes associated with structures erected in the Gulf of Mexico. These structures are known to be popular sites for recreational fishermen, SCUBA divers, and some commercial fishermen. Therefore, removal of structures no longer useful for petroleum production will negatively impact fish and fishing.

3. Onshore Activities and Facilities Estimates

a. Estimated Onshore Facilities Use Requirements

The estimated onshore facilities requirements for each offshore development area are listed in Table IV-9. It is assumed that OCS activity occurring in the Texas and Louisiana offshore development areas (Tables IV-3 and IV-4) will be supported from service bases and support and processing facilities in Texas and Louisiana, respectively. This is based on the fact that these two states have a highly developed offshore oil and gas development and processing infrastructure capable of effectively meeting the estimated requirements of the proposed sales. Use of existing facilities in Texas and Louisiana is assumed and little or no expansion is expected. A common cumulative impact assumption is that offshore production could significantly contribute to the need for one new pipeline landfall in Texas and one in Louisiana. Exploratory drilling will require the use of 4-8 existing service based in Texas and 10-15 existing service based in Louisiana. Development drilling and production activity will utilize 2-3 existing bases in Texas and 8-12 existing based in Louisiana. Use of existing refineries and gas processing plants is assumed (USGS estimates that 100% of production will be handled by existing facilities or facilities to be built as a result of tracts leased in previous sales.).

OCS activity occurring in the Upper Gulf offshore development area is expected to require 1-2 service bases. It is assumed that existing or expanded service base facilities located in Jackson County, Mississippi, will be used. Use of existing onshore support services and facilities in Mississippi and Alabama, as available, and in Louisiana is expected. The estimated level of OCS development activity and production for the two proposed sales is expected to be insufficient to result in the establishment of major new service support industries in Mississippi or Mobile County, Alabama; or construction of a processing facility in Jackson County, Mississippi.

Estimated OCS activities occurring in the Florida Shelf offshore development area are expected to require 1-4 service bases. Use of existing, expanded, or new service base facilities at Port Manatee is assumed; Port Tampa could also provide potential locations for such facilities, if necessary. Because established service support facilities are lacking on the Florida west coast, it is assumed that most of the related requirements

Table IV-9

Summary of Onshore Facility Use Requirements for Each Offshore Development Area

Facility	Texas	Louisiana	Upper Gulf	Florida Shelf
Service Bases:				
Exploratory Drilling	2-6 exist. bases in Tx.[1]	3-10 exist bases in La.[2]	1-2 bases in Miss. or Ala.[3]	1-4 bases in Fla.[4]
Development/Production	3-6 existing bases in Tx.[1]	5-10 exist bases in La.[2]	1-2 bases in Miss./Ala.[3]	1-3 bases in Fla.[4]
General Shore Support, Incl.	Existing facilities in Tx.	Existing facilities in La.	Existing facilities in Mississippi and Alabama, as available, and existing facilities in La.	Existing facilities in Fla. as available, and existing facilities in Tx. and La.
Pipeline Coating Yards	" " "	" " "	Existing facilities in La.	Existing facilities in La.
Pipeline Service Bases	" " "	" " "	Existing facilities in Miss., Ala., or La.	Existing facilities in Fla. or La.
Pipeline Landfalls	" " "; also assume may contribute to new pipeline landfall.[5]	" " "; also assume may contribute to new pipeline landfall.[6]	Assume may contribute to new pipeline landfall.[7]	Assume contributes to new pipeline landfall.[8]
Terminals & Storage Facilities	Existing facilities in Tx.	Existing facilities in La.	Existing facilities in Miss. or La.	Existing, expanded or new facilities in Fla.[9]
Platform Fabrication Yards	" " "	" " "	Existing facilities in La.	Existing facilities in La.
Gas Processing Plants	" " "	" " "	Assume may contribute to new facility in Miss.[10]	None required; minimal gas resources in area.
Refineries	" " "	" " "	Existing facilities in Miss., Ala., or La.	Existing facilities outside local region.[11]

[1] Potential existing service base locations in Texas include: Sabine Pass; Galveston; Freeport; Port O'Connor; Rockport; and Ingleside.

[2] Potential existing service base locations in Louisiana include: Cameron, Grand Chenier; Intercoastal City; Lafayette; Morgan City; Houma; Duloc; Golden Meadow; Leesville; Harvey; Grand Isle and Venice.

[3] Assumes use of existing, expanded or new service base facilities in Jackson, Co., Miss., and for Mobile County, Ala.

[4] Assumes use of Port Manatee existing or expanded facilities for 1 or 2 service bases.

[5] Assumed location for analysis purposes is between Nueces and Willacy Counties.

[6] Assumed location for analysis purposes is between St. Bernard and Iberia Parishes. This is a cumulative impact assumption.

[7] Assumed location for analysis purposes — Jackson Co., Miss. or Mobile County, Ala. This is a cumulative impact assumption.

[8] Assumed location for analysis purposes is in Charlotte, Manatee or Hillsborough County. This is a cumulative impact assumption.

[9] This is a cumulative impact assumption for analysis purposes. Use of existing, expanded or new facilities at Port Manatee, Port Tampa, and Port Boca Grande.

[10] Assumed location for analysis purposes — Jackson Co., Miss. This is a cumulative in past assumption.

[11] Assumes that oil will be shipped from local region by barge or tanker to existing refineries.

will be supplied from Texas and Louisiana-based companies. No new major support service industries are expected to be established on the Florida west coast as a direct result of the proposed sales. Cumulative impact assumptions include contribution to a new pipeline landfall with a probable location in Manatee County (Port Manatee) with additional possible locations in Hillsborough and Lee Counties and potential construction of expanded or new terminal and storage facilities at Port Manatee (Manatee County), Port Tampa (Hillsborough County), or Port Boca Grande (Lee County).

It should be noted that the actual locations of the specific onshore facilities finally selected, assuming the proposed sales are held and that development ensues, will largely depend on the number and distribution of lease holdings; the number of companies with holdings; the schedule for exploration and subsequent development activities; the location, capacity, and availability of existing service/support and processing infrastructure; and local land planning, environmental, and other policies and regulations.

b. General Resource Requirements and Other Impact Producing Factors

The OCS-related activities/facilities located in the Texas, Louisiana, and/or Florida onshore areas will have requirements for labor, land, and facilities (site alteration and construction) and public and private services. In addition, they produce residuals such as air emissions, wastewater (contaminants and pollutants), and solid wastes. Each of these requirements and residuals is an impact producing factor.

The labor or employment requirement impacts for both onshore and offshore OCS-related activities are discussed in Section IV.C.4. The following paragraphs include a brief description of the expected general effects that the proposed sales will have on existing (or anticipated) resource requirements and residuals levels:

(1) Land. Little or no additional land will be required in Texas and Louisiana. New or expanded service bases in Mississippi, Alabama, and/or Florida could require up to 5-10 acres of land in each state. Cumulative impacts could require additional rights-of-way for a pipeline landfall and an inland route in each state. Additional cumulative impacts could result from expansion of existing or construction of a new marine terminal and storage facilities in Florida requiring about 40 acres and in the construction of a new gas processing plant in Mississippi requiring 50-75 acres.

(2) Water Usage. Overall water consumption in Texas and Louisiana is expected to remain fairly stable. In Mississippi, Alabama, and Florida a small increase is expected in water usage (estimated at up to 26 million gallons per year for supply boats during exploratory drilling and up to 16 million gallons per year during development drilling at the onshore service base).

(3) Air Emissions. Current OCS-related air emission levels in Texas and Louisiana are not expected to significantly change. Expanded OCS activity in Mississippi, Alabama, and Florida will add a small amount of emissions due to fuel storage tanks, vehicle operation, pipe coating, and other operations.

(4) Wastewater Contaminants. Negligible change in OCS-related wastewater contaminant levels is expected in Texas and Louisiana. Small amounts of additional wastewater contaminants will result from expanded OCS operations in Mississippi, Alabama, and Florida.

(5) Solid Wastes. Negligible changes are expected in overall amounts of solid wastes produced in Texas. In Mississippi, Alabama, and Florida new OCS exploratory and development drilling will result in moderate increases in the amount of solid wastes.

4. Employment and Population Estimates

a. Direct Employment Estimates

Direct employment consists of those workers employed by establishments primarily engaged in the production of crude petroleum and natural gas. Types of activities included are exploration, drilling, oil and gas well operation and maintenance, and the operation of natural gasoline and cycle plants. Also included are such basic activities as emulsion breaking and desilting of crude petroleum in the preparation of oil and gas customarily done at the field site. Historic data on direct employment are available from USDC, County Business Patterns, and are specified under Standard Industrial Classification (SIC) Code 13. The estimated direct employment that will be generated by proposed Sales 67 and 69 is summarized in Table IV-10.

Estimated total direct employment will reach a peak of 4,060 in 1984, which represents the height of exploratory and delineation drilling activity. The peak levels within the four distinct areas are: Texas-1,230 (1986); Louisiana-1,740 (1984); Upper Gulf-370 (1985-86); and the Florida Shelf-770 (1986). After a decline in estimated total direct employment in 1985 due to decreasing exploration activity, there will be an increase to 4,020 employees in 1986, which represents the peak year for development drilling activity in the study area. Thereafter, the estimated total direct employment will decline sharply in 1987 with a more gradual decline until 1991. At that point stable employment and production will be reached at least through the year 2000.

In order to assess the impact of these direct employment estimates within the study area, it is necessary to determine the existing levels of direct employment as well as projected levels under both with and without Sales 67 and 69 conditions. While the general impact of OCS activity related to these sales will occur throughout the 74 county/parish area specified earlier in this report (Section III.C.1.), the primary impacts will be limited to the following areas, which are characterized as four distinct regions:

Louisiana - Ascension, Assumption, Calcasieu, Cameron, East Baton Rouge, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Livingston, Orleans, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, Tangipahoa, Terrebonne, Vermilion, and West Baton Rouge parishes.

Texas - Aransas, Brazoria, Calhoun, Chambers, Galveston, Harris, Jefferson, Matagorda, Nueces, Orange, and San Patricio counties.

Upper Gulf - Jackson (Mississippi) and Mobile (Alabama) counties.

Florida Shelf - Charlotte, Hillsborough, Lee, Manatee, Pinellas, and Sarasota counties.

Figure IV-4 illustrates total direct employment in these areas with and without Sales 67 and 69 conditions for the years 1967-2000. This information represents the basis for analyzing the impact of these sales on total and new resident employment and population within the study area.

b. Total Local Resident and New Resident Employment Estimates

Estimated total local resident employment includes all direct, secondary, and induced employment generated by OCS activities for residents of particular onshore regions (called onshore impact areas in this analysis). New resident employment in this study refers to that portion of a net change in total local resident employment filled by workers who are new residents in the onshore impact areas. Table IV-11 summarizes these employment estimates for the four major onshore impact areas.

As shown in Figure IV-4, direct oil and gas employment (SIC Code 13) in Louisiana and Texas onshore impact areas, which includes adjacent offshore employment, has fluctuated over the 1967-1977 period with a rise until about 1972 and a decline thereafter. Declining oil production since 1972, as well as increased capital intensity within these industry sectors, may account for these conditions. Regardless of the causes, it is assumed herein that a forecast of direct oil and gas employment in Louisiana and Texas onshore impact areas with Sales 67 and 69 will be the continuation of existing direct and total oil and gas employment levels in these areas. Conversely, the without sales forecast represents the residual after the employment impacts expected from Sales 67 and 69 are subtracted from these with sales projections. The employment impact forecasts for Sales 67 and 69 were derived from information on expected exploration and development requirements prepared by USGS, as well as actual employment patterns experienced subsequent to previous Gulf of Mexico lease sales. Furthermore, since there will be no net increase in direct or total local resident employment due to Sales 67 and 69, individually, there will be no new resident employment associated with these sales in the Louisiana and Texas onshore impact areas.

Table IV-10

Direct Employment Estimates

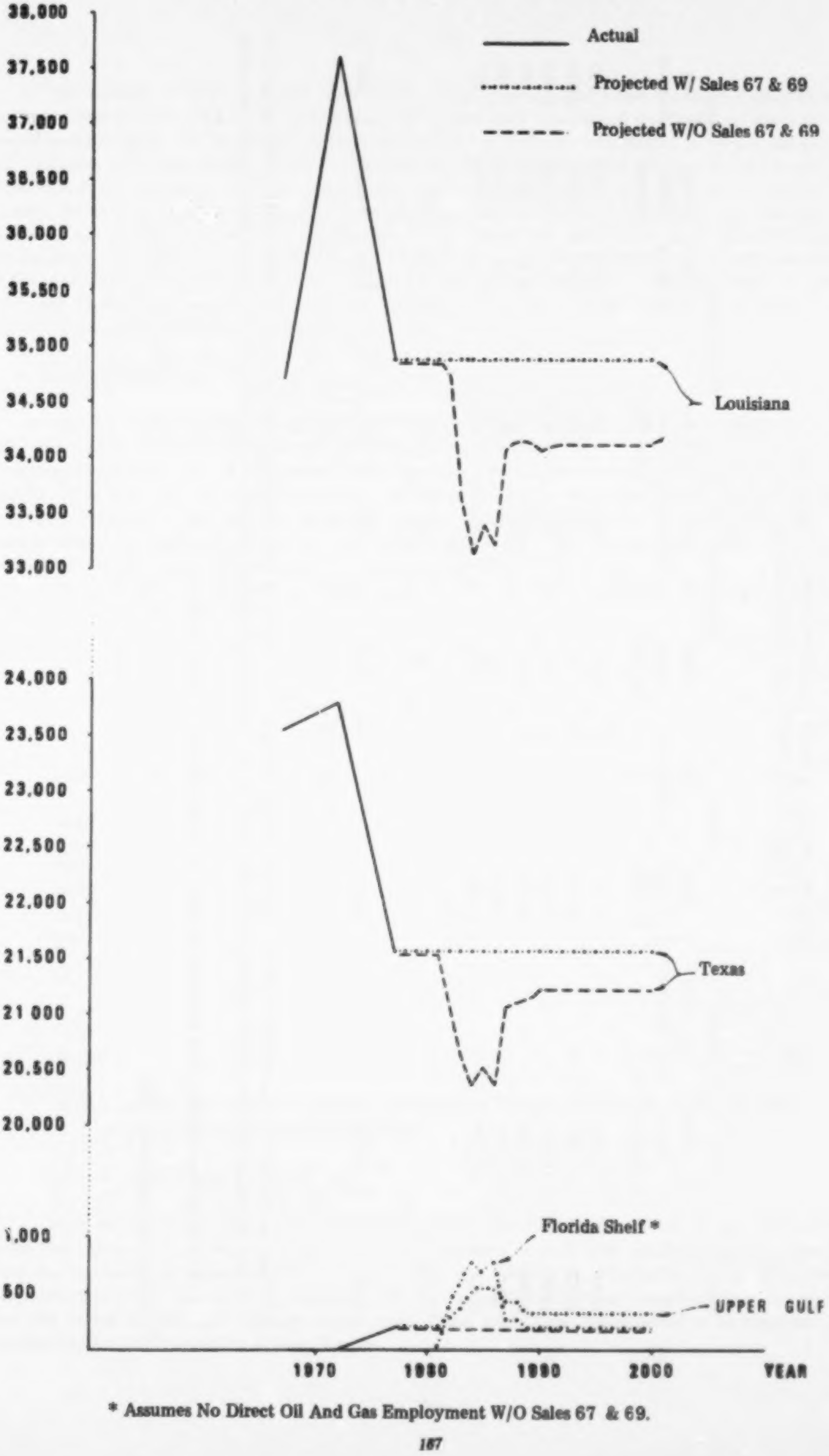
(By Place of Work)

Year	Texas	Louisiana	Upper Gulf	Florida Shelf	Total
1982	480	120	110	350	1,060
1983	940	1,440	190	580	3,150
1984	1,220	1,740	340	760	4,060
1985	1,070	1,470	370	690	3,600
1986	1,230	1,650	370	770	4,020
1987	520	820	260	260	1,860
1988	480	740	250	270	1,740
1989	430	740	150	270	1,590
1990	350	810	150	180	1,490
1991	350	760	150	180	1,440
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
2000	350	760	150	180	1,440

Note: Results have been rounded to the nearest ten.

Source: BLM estimates, 1980.

Figure IV-4. Total Direct Oil and Gas Employment



* Assumes No Direct Oil And Gas Employment W/O Sales 67 & 69.

Table IV-11

Estimated Total Local Resident and New Resident Employment
Generated by Sales 67 and 69 OCS Activity

Year	Louisiana		Texas		Upper Gulf		Florida Shelf		Total	
	Total Local Resident[1]	New Resident[2]	Total Local Resident[1]	New Resident[2]	Total Local Resident[1]	New Resident[2]	Total Local Resident[1]	New Resident[2]	Total Local Resident	New Resident
1982	220	-	3,180	-	400	100	1,290	320	5,090	420
1984	3,190	-	8,050	-	1,290	320	2,810	700	15,340	1,020
1986	3,010	-	8,120	-	1,410	350	2,850	710	15,390	1,060
1988	1,340	-	3,170	-	960	240	1,000	250	6,470	490
1990	1,470	-	2,310	-	590	150	670	170	5,040	320
1992	1,370	-	2,310	-	590	150	670	170	4,940	320
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
2000	1,370	-	2,310	-	590	150	670	170	4,940	320

[1] Based on the following multipliers of direct employment after adjustment to a residence definition: Louisiana-1.8; Texas-.6; Upper Gulf-3.7; Florida Shelf-3.7. These multipliers represent actual relationship in 1977 (County Business Patterns) for onshore impact areas in Louisiana, Texas, or the study area, as a whole.

[2] The assumptions regarding these estimates are discussed in Section IV.B.2. of this DEIS.

Source: BLM estimates, 1980.

The forecast of direct and total local resident employment in the Upper Gulf and Florida Shelf areas, however, reflects a different set of assumptions. These areas have experienced practically no direct oil and gas employment in past years, and much indirect employment has probably been related to oil and gas activity off the Louisiana and Texas coasts. It seems reasonable that these conditions will continue in the absence of OCS development in Upper Gulf or Florida Shelf waters. Since the USGS estimates of resources for Sales 67 and 69 include the existence of hydrocarbons in these areas, it is assumed that any exploration and development will involve a net increase in oil and gas employment in the Upper Gulf and Florida Shelf onshore impact areas. Furthermore, it is assumed that about 25% of the total local resident employment in these areas associated with these sales will be filled by new residents. As a percentage of total employment from any source in the Upper Gulf and Florida Shelf areas, the new resident employment in these onshore impact areas is expected to be miniscule, less than 0.2% and 0.1%, respectively.

c. New Resident Population Estimates

The new resident population generated by OCS-related activity is perhaps the best indicator of the potential impact on the demand for public and private services and facilities. Both the total growth and the period of time over which the growth is expected to occur (the rate of growth) are important in determining the potential impact on an area's or community's economic and social well-being. The expected rate of growth is the most important indicator of the potential severity of impact. Experience in western state communities affected by energy development indicates that a population growth rate of over 10% per year will severely strain a community's ability to provide an adequate level of local services (ASPO, 1977).

The estimated new resident population generated by OCS activity related to the proposed sales is summarized in the following table:

Table IV-12

New Resident Population Estimates for
OCS Sales 67 and 69 Onshore Impact Areas

Year	Louisiana	Texas	Upper Gulf	Florida Shelf	Total
1982	-	-	230	740	970
1984	-	-	740	1,610	2,350
1986	-	-	800	1,630	2,430
1988	-	-	550	570	1,120
1990	-	-	340	390	730
1992	-	-	340	390	730
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
2000	-	-	340	390	730

Note: Assumes new resident population multiplier of 2.3 per new resident employee. Computations are rounded to the nearest ten.

Source: BLM estimates, 1980.

New resident population will be generated in direct proportion to the amount of new resident employment that occurs in each onshore impact area. The maximum or peak new resident population generated by OCS development is estimated at 800 in the Upper Gulf and 1,630 in the Florida Shelf areas. After these peaks are reached in 1986, new resident population will decline until 1990 when it reaches 340 in the Upper Gulf and 390 in the Florida Shelf onshore impact areas. These lower levels are expected to be supported by OCS production and employment for at least 10 years.

Analysis of the total new resident population growth and its average annual rate of increase, in comparison to the existing and projected population levels and rates of change for the onshore impact areas, indicates that it would be very unlikely that any local communities in the study area will be subjected to an amount or rate of population growth that would strain its ability to adequately provide community services and facilities. The estimated maximum new resident population (peak year, 1986) is very small in relation to the total population projected for the Upper Gulf and Florida Shelf onshore impact areas—about 0.1% in each case.

However, even this small relative amount of population growth could, if concentrated in one or two small communities within the larger areas, contribute to existing or potential growth problems in such communities. Additional discussion on the expected impacts of new resident population on community services and facilities and on local fiscal balance is included in Appendix B of the DEIS.

5. Marsh Loss

The Louisiana Coastal Region (LCR) encompasses the Mississippi Deltaic Plain Region of the eastern and central coast of Louisiana and the Chenier Plain Region of western coastal Louisiana. In 1968 the LCR contained approximately 2.5 million acres of marsh, ranging from fresh to saline; 1.8 million acres of ponds and lakes; and 125 thousand acres of bayous and rivers.

The LCR wetlands support the largest volume of estuarine-dependent fish and shellfish landings in the U.S. and a substantial saltwater sport fishery. The Louisiana wetlands also support a large number of resident and migratory waterfowl with attendant hunting opportunities. Coastal Louisiana produces the largest fur and alligator hide harvests in North America.

Additionally, these coastal wetlands serve as important storm buffers capable of absorbing wind-driven waves and at the same time providing a reservoir for storm waters, thereby, reducing the possibility of flooding further inland. Another important feature of coastal wetlands is their ability to take up and recycle organic nutrients, thus preventing eutrophication of water bodies and nursery grounds for commercially important fin and shellfish species. (Craig, et al., 1979).

Wetland deterioration accounts for an annual marsh loss of 22,000 acres. This wetland deterioration can be attributed to land loss and saltwater intrusion. The land loss in coastal Louisiana is due to natural and man-induced causes. Among the natural causes are subsidence, compaction, and erosion following the cessation of active delta building at the mouth of the Mississippi River. Man-induced causes for land loss in coastal Louisiana include: construction of navigation channels, mainline Mississippi River levees, upstream diversions, and flood control reservoirs. These features have virtually eliminated overbank flooding, causing riverborne sediments to be deposited into the deeper Gulf of Mexico; this prevents delta building but facilitates subsidence and erosion of existing marshes. Canal dredging and associated spoil deposition, as well as draining of wetlands for agricultural purposes, further contribute to land loss in coastal Louisiana. It is estimated that 25% of the total land loss in coastal Louisiana during the past 30 years can be attributed to oil and gas industry dredging. Historically, OCS oil and gas development contribution to marsh loss in coastal Louisiana has been much less than oil and gas-related activities in the LCR itself since these latter operations are actually carried out in Louisiana marshes. Crew boat traffic to the OCS and the construction of pipelines for bringing oil and gas from the OCS ashore have, in the past, contributed to marsh loss in the LCR. It is extremely unlikely that additional navigation channels will be constructed as a result of these proposed sales. If, as a result of these sales, the construction of additional pipelines off the Louisiana coast is required, no direct and additional adverse impacts on the Louisiana marshes and wetlands are anticipated unless new pipelines constructed on the OCS will make landfall in the Louisiana marshes rather than tying into existing trunk lines. It is considered extremely unlikely that new pipelines will be laid through the LCR as a result of these proposed sales.

Saltwater intrusion, facilitated by subsidence, the construction of canals and navigation channels, and the prevention of freshwater influx by leveeing coastal streams and rivers, has wide ranging adverse effects. The most important ones are the conversion of fresh marsh to more saline and biologically less productive marsh types; and allowing the advance of the predaceous oyster drill on productive oyster reefs (Frugé, 1980). The overall trend of habitat changes in the LCR shows an increase in spoil areas, upland developed areas for agricultural and urban use, and estuarine open water areas. There is a loss in forested wetlands (swamp habitat) and a drastic loss in marsh habitat, especially fresh marsh (Frugé, 1980, personal communication). Losses of all marsh types ranging from fresh to saline along the LCR are estimated at over 22,000 acres every year.

Implications of annual marsh losses of this magnitude are manifested primarily in the adverse effects on Louisiana's estuarine-dependent fisheries, especially the shrimp and menhaden fishery, Louisiana's most valuable fishery resource. Marshes and shallow waters in the LCR serve as detritus (food)-producing and nursery areas for the many estuarine-dependent commercial and sport fish species. The losses of wetlands in the LCR have a direct negative effect on these fisheries.

Waterfowl and furbearers dependent on the LCR are subject to serious habitat losses resulting from future marsh losses and saltwater intrusion. Continued marsh loss and wetland deterioration will, consequently, cause waterfowl hunting opportunities to decline and cause reduction of the fur and alligator hide harvests in coastal Louisiana (Fruge', 1980).

D. Environmental Impacts of the Proposal and Alternatives

1. Impacts on Identified Areas of Major or Significant Environmental Concerns

As a result of the scoping activities for the Gulf of Mexico region which have included coordination, consultation, and meetings with federal and state agencies, other groups and the general public, field surveys and staff analysis, the following four major or significant areas of environmental concern were identified as the issues to be analyzed in depth in the EIS:

Biologically Sensitive Areas
Florida Manatee
Recreational Fishing
Coastal and Marine Birds

Since tracts for Alternative E (Reoffering of Tracts from Sales A66 and 66) are unknown at the present time, the environmental consequences for these significant areas will be reanalyzed when the tracts are identified (Section II.E.).

The East and West Flower Garden Banks are prominent among the biologically sensitive areas in the Gulf of Mexico. Concerns have been expressed regarding the potential adverse effects of oil and gas exploration and development on these banks. While oil and gas-related activities are being conducted near the Flower Garden Banks, little evidence has surfaced that would indicate damage to the biota of that region resulting from these activities.

There are two major transmission/gathering systems in the area of the East and West Flower Garden Banks. The HIOS (High Island Offshore System) system has three major trunk pipelines in the area north and west of the West Flower Garden Bank. The STINGRAY gathering system has three major trunk pipelines to the north and east of the East Flower Garden Bank. There are approximately 40 active leases within about 10-15 nmi of the Flower Garden Banks; over one-half of these tracts presently producing gas. Four of these are presently producing oil (High Island Area, South Addition, Block A-571, A-572, A-573; and High Island Area, East Addition, South Extension, Block A-334).

Thus, the East and West Flower Garden Banks are biologically sensitive areas located near the center of the highly developed Plio-Pleistocene gas trend in the High Island-West Cameron production area. These production activities have apparently caused no noticeable adverse effect on these biologically sensitive areas according to results of a six-year study by Texas A&M University for BLM.

These studies are known as the "Topographic Features Studies" and were contracted as follows:

Contract Number	Year	Cost
CT5- 4	1975	$ 450,000
CT6-18	1976	638,217
CT7-15	1977	744,361
CT8-35	1978	2,492,949
CT8-35	1979	368,505
CT0-25	1980	799,700
	TOTAL	$5,493,732

Thus, about 5½ million dollars have been expended on collecting environmental information and assessment of impacts on the Flower Garden Banks and 36 of the biologically sensitive areas along this part of the Gulf of Mexico continental margin. The major impact shown for these banks has been due to anchoring of large ships, mainly tankers, and not oil and gas drilling and production.

a. Impact on Biologically Sensitive Areas

(1) Alternative A (Hold the Sales as Proposed)

Biologically Sensitive Areas in the Central and Western Gulf

Eight biologically sensitive areas in the western and central Gulf are within or near tracts being considered for this proposal. These areas are: Southern Bank, Applebaum Bank, Parker Banks, Diaphus Bank, Geyer Bank, Fishnet Bank, and the East and West Flower Garden Banks (Visual 1 and the tract overlay; see also Visual 4 of the FEIS for Sales A62/62). These areas are discussed in Section III.B.2. The biological stipulation as described in Section I.C.2.b. will provide protection to these areas from the potential impacts of oil and gas operations by prohibiting operations on the banks themselves and requiring shunting of the muds and cuttings (Section IV.C.2.) within 1 nmi of the banks. For Applebaum, Parker, Diaphus, Geyer and Fishnet Banks, the stipulation would further require that between 1-3 nmi either shunting or monitoring of the impacts on the biota of the banks would be required; for Southern Bank, shunting during production drilling only would be required in the 1-3 nmi area. Finally, for the Flower Garden Banks, shunting and monitoring would be required within 1 nmi of the banks, and shunting only would be required between 1-3 nmi of the 85-m isobath of the banks.

Biologically Sensitive Areas in the Eastern Gulf

The live bottom areas of the eastern Gulf are less precisely known than the topographic features mentioned above. These are scattered low relief features (Section III.B.2.) which will be protected from potential impacts due to oil and gas activities by the biological stipulation described in Section I.C.2.b. The results of the survey required by the stipulation will guide the USGS DCM in this decision on whether or not to permit a specific well location. It is anticipated that in most cases no well locations will be permitted within 1 nmi of an identified live bottom area. It is conceivable that for various reasons (economics, location of the hydrocarbon formation, etc.) it may be necessary to drill a well closer to live bottoms than 1 nmi. If so, the DCM with advice from FWS, BLM, and the affected states has several remedies available to reduce potential impacts. It is certainly true that the physical placement of a rig or platform and the disposal of drilling muds and cuttings in the ocean (if removal is not required) will have a severe impact on the individual organisms smothered, but this impact will be localized, and it is our considered judgment that such localized effects will have no significant impact on the species, larger communities, populations, or ecosystem.

Potential for Impact Due to Routine Offshore Oil and Gas Operations

Nevertheless, unless drilling muds and cuttings are transported out of the area for disposal, a significant amount of material will be discharged into the water (Section IV.C.2.). For each "typical" well to 10,000 feet, about 511 yd^3 of cuttings and roughly 4,550 barrels of muds will be discharged (Otteman, 1976). This will cause some turbidity in the water for a distance of 1-2 nmi; it is believed most of these muds will settle to the bottom within 1 nmi in a layer too thin to alter the substrate and the organisms living thereon to any major extent. The cuttings will form a low mound (about 20 cm high) right under or slightly down-current of the discharge pipe which is about 10 m under the water surface. To the extent that these cuttings represent a different substrate (i.e., different grain size) than the original bottom, these cuttings will smother the organisms originally there which will be replaced by organisms preferring the new substrate type. This area will be extremely small - on the order of 50 m or less in diameter. The ocean floor is not a stable environment. Currents will disperse the cuttings over time (sometimes very short periods) so that any impact on the floor due to cuttings will not even be noticeable in a year or two (Offshore Operators Committee, 1976).

A monitoring study was conducted on an exploratory well drilled off the South Atlantic states. The final report summarized the findings as follows (EG&G, 1980):

> "This study showed that discharges of drilling muds and cuttings from an exploratory drilling operation caused no statistically significant change (α=0.05) in the barium and chromium concentration of the bottom sediments. Despite the fact that high barium solids (>200 μg/g) were collected in all of the sediment traps, there is no evidence that these solids remained as part of the bottom sediments. Bottom currents were apparently strong enough to resuspend any discharged material that settled out and carry it out of the study area. This conclusion is evident, in part, by bottom photographs which showed localized changes at several stations.
>
> "Measurable quantities of solids were collected in all of the functioning sediment traps. The largest amounts of solids and the highest concentrations of barium and chromium were detected at the station positioned 500 m from the well site in the direction of the hard bottom area. A previous study reported background barium and chromium concentrations for suspended matter ranging from 0.314 μg/g to 1.07 μg/g and 0.001 μg/g to 0.003 μg/g, respectively (Texas Instruments, 1979). The lowest concentrations of barium and chromium detected for the solids collected in the traps were 179 μg/g and 8.1 μg/g, respectively. The barium concentrations of the trapped materials indicate that drilling discharges were indeed advected toward the hard bottom area as well as in other directions.
>
> "Comparison of barium and chromium concentrations for sediment grab samples collected prior to the onset of drilling and within several hours after the final discharge of drilling muds that no significant (α = 0.05) change took place. Concentrations of barium and chromium in the postdrilling grab samples were slightly lower than those detected in the predrilling samples. Barium concentrations in the Georgia Bright area range from 30 μg/g to 87 μ (Texas Instruments, 1979), well within the range of the measured values for both the pre- and post-drilling samples. Chromium concentrations were higher than previously reported for the general area (Texas Instruments, 1979). Statistical analysis of the data showed that no significant (α = 0.05) change took place between the pre- and post-drilling data sets."

Potential for Impact Due to Accidents

A potential exists for impacts to biologically sensitive areas in all parts of the Gulf due to accidents occurring during offshore oil and gas operations. The most serious impacts would be caused by oil spills, which may result from a number of different causes, and by gas blowouts. The types of accidents, their frequencies of occurrence, and their generic impacts are discussed in Section IV.C.1.

Oil spills may occur from seabed sources (pipeline accidents, oil well blowouts) or sea level sources (tanker accidents, leaks on the platform, etc.). Oil may be transported downward to some extent in the water column due to normal circulation processes but should not be transported below the pycnocline under normal conditions. Oil spilled from seabed sources or spilled at the surface under certain circumstances, such as severe storms, may be entrained and transported for great distances in subsurface currents. This was the case for the Ixtoc-1 spill, where some oil released into the water column at the seabed circulated in the Gulf below the surface for months before reaching the Texas coast. Only a large spill would offer any significant potential threat to biosensitive areas.

Gas well blowouts generally pose less environmental risk than do oil spills, resulting only in very high concentrations of suspended sediments and increased levels of gas in the water column. To the extent that oil or condensate is present in the reservoir, some liquid hydrocarbons may also be injected into the water column. The suspended sediments may be carried some distance by currents, but the bulk of the sediments may be redeposited within a few thousand meters of the blowout site. Low-molecular-weight- hydrocarbons (gases) will dissolve in the water column until saturation is reached; both gaseous and dissolved low-molecular-weight hydrocarbons will be released into the atmosphere within a few days of a blowout without major biological effect. Liquid hydrocarbons will be diluted to background levels within a few thousand meters distance from the blowout site and will degrade with time.

A minor blowout occurred in March 1980, only 4.3 nmi northeast of the East Flower Garden Banks, in High Island Area, East Addition, South Extension, Block A-368. This blowout occurred when gas-charged sediments blew through the casing, releasing a small quantity of drilling mud into the environment. There was neither a discharge of seabed sediments nor oil or liquid hydrocarbons. No slick or other sign of environmental pollution was observed; therefore, no studies were conducted to determine impact at the Flower Garden Banks or elsewhere. Although this was a minor accident in terms of environmental impact, the platform was heavily damaged by the explosion and fire; six fatalities and twenty-nine injuries resulted.

A massive gas well blowout occurred in November 1976, approximately 36 nmi west of the West Flower Garden Bank in High Island Area, South Addition, Block A-563. This blowout occurred when the gas blew out around the casing and resulted in a crater approximately 550 m in diameter by 110 m deep. The entire platform structure was lost in the crater. Studies at this blowout indicated that the sediments resuspended by the blowout tended to settle out in proximity to the blowout site with all deposition occurring within 3,000 m of the blowout site (Figure IV-5). No environmental impact due to hydrocarbons in the water column was found (Brooks and Bernard, 1977).

The biologically sensitive areas of the central and western Gulf discussed above occur in a generally gas prone rather than oil prone region of the Gulf. In view of the low probability of a blowout or spill occurring in proximity to these features, it is unlikely that they will be adversely affected by offshore oil and gas activities. Should a gas well blowout occur, however, they may be covered by suspended sediments for a short while, and some of these sediments may be deposited on the banks. The banks off south Texas are typically bathed in the nepheloid layer and are characterized by fine sediments on the bank. Deposition of additional sediments might result in additional stress to the communities, but since the nature of the stress would be similar to that normally encountered by the communities, it probably would not result in major environmental effects unless sedimentation on the bank was quite severe. The upper portions of the higher-relief banks, including the East and West Flower Garden Banks are typically not exposed to either nepheloid layers or deposition of fine sediments. Should a gas well blowout occur near these features, the suspended sediment plume might pass over the banks and cause stress to filter-feeding organisms and photosynthetic plants. Fine sediment would probably not be deposited on the upper bank itself since the coarse coralline sands characteristic of the upper Flower Garden Banks indicate that these zones are not typified by deposition of fine sediments. Studies of currents near these banks indicate that fine sediments, such as drilling muds or resuspended benthic sediments, reaching the lower portions of the bank would not be carried to or deposited on the upper bank.

Significant impacts could result if an accident, which resulted in oil or drilling muds reaching the upper portion of the banks, occurs near the East or West Flower Garden Banks. Effects of oil might include death of some organisms and sublethal stresses on others which might reduce overall "health" of the reef community, perhaps resulting in losses of significant portions of the community. Should substantial amounts of used drilling muds be released near the reef crest, impact could also occur due to both physical and toxic effects. Physical effect would be minor and short-lived, and would be similar to effects of resuspended benthic sediments (stresses to filterfeeders, photosynthetic plants, etc.). Physical burial of organisms would probably not occur to any great extent, and fine mud sediments would be transported off the reef within a short period of time by normal circulation processes. Toxic effects of some dissolved mud components such as lignosulphates could result in lethal or sublethal stresses, but again would be short-lived because of transport of dissolved materials out of the reef community to the open ocean. The likelihood of either an oil spill or a bulk muds spill affecting either the East or West Flower Garden Banks is very small (about 0.4%).

For purposes of consideration of potential adverse environmental impacts at the Flower Garden Banks due to both routine operations and accidents, we have made the following developmental assumptions: these two tracts, which are less than 0.5% of the total tracts offered, are gas prone with commercially exploitable reserves; a total of eight exploratory wells will be drilled on the two tracts; these tracts are within the proposed NOAA Marine Sanctuary boundary and would be subject to further regulations now being developed by NOAA; one production platform would be installed at each tract; no major transmission lines would be laid; and shunting of drilling muds, cuttings, and produced formation waters will result in only localized, minor impacts in the vicinity of the platforms with no significant impacts on the biologically sensitive communities which occur in the upper portions of the banks. We assume that transportation of produced reserves will be by pipelines tying in to existing

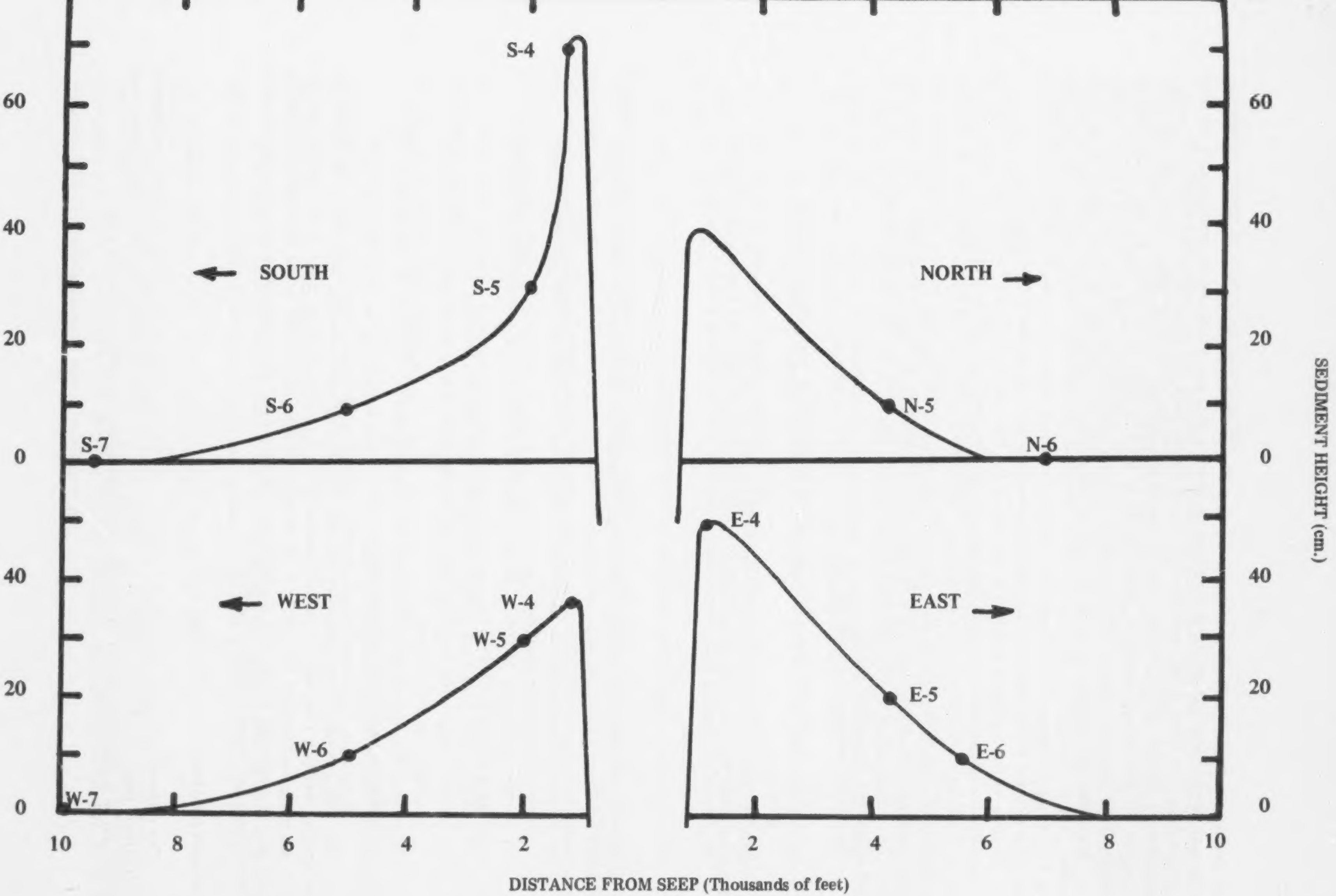


Figure IV-5. Cross-sectional Diagrams of Apparent Deposition of Material around the Blowout Crater.

Source: Brooks, J.M. and Bernard, B.B. 1977. Report to Pennzoil Oil Company through Decca Survey Systems Inc. on Geochemical study around a platform blowout in High Island, South Addition Block A-563. Addendum IV, p. 43, Fig. 17. of Pennzoil Co. Report No. 2, July 28, 1977, Houston, TX.

major transmission lines. For Block A-374, near the East Flower Garden Bank, the closest tie-in would be with the Stingray Pipeline now terminating at a platform in Block A-368, and would require approximately six miles of new pipelines. For Block A-385, near the West Flower Garden Bank, the closest tie-in would be with the High Island Offshore System (HIOS) Pipeline now terminating at a platform in Block A-356, and would require approximately 12 miles of new pipelines. Some barging of product could occur during testing of wells for oil production prior to emplacement of pipelines, but there is a low probability of this occurring in a gas prone area.

The biologically sensitive areas of the eastern Gulf occur in a generally oil prone region of the Gulf; therefore, they are at a greater risk from accidents. Should an oil spill from a seabed source occur near these areas, they might be impacted to a considerable extent. The actual extent of the impact and the length of time required for recovery would depend on the magnitude, duration, and relative location of the spill.

Because of the competing activities in the area of the East and West Flower Garden Banks (nomination of these areas for marine sanctuary status and stringent controls on oil and gas development activities being imposed by the Environmental Protection Agency), an "Interagency Committee of Flower Garden Banks Research and Monitoring" was established in 1979. The intent of this committee was to prepare a comprehensive plan to address information needs for a short and long term management of the biological resources of these coral banks. EPA, NOAA, and DOI personnel serve on this committee, which in 1981 changed its name to the "Interagency Monitoring Committee" (IMC).

The primary purposes of the IMC are to:

(a) identify major banks information gaps related to the regulatory requirements of each agency;
(b) recommend research and monitoring programs to provide needed information on the banks;
(c) recommend priorities for ongoing and planned banks research and monitoring programs;
(d) coordinate ongoing and planned banks research and monitoring programs to avoid duplication; and
(e) function as an interagency information exchange mechanism.

The IMC has prepared a draft "Proposed Flower Garden Banks Research and Monitoring Program" which purports to:

(a) be mutually and singularly beneficial to each of the participating federal agencies for carrying out its legislative mandates;
(b) provide information needed by the agencies charged with managing operations affecting the Flower Garden Banks area;
(c) provide a focus for federal research and development activities involving the area;
(d) provide a means for involving and encouraging nonfederal interests and organizations to contribute information; and
(e) extend the management experience and research results developed by this program to analyzing other sensitive marine areas.

The draft Program is very ambitious and will require a significant funding commitment by each of the three agencies involved. It remains to be seen whether such a commitment will be made. At the present time, the IMC is not recognized formally by a MOU or IA between the agencies involved. In the meantime, BLM has continued its own monitoring programs at the banks (now in its seventh year), and a synthesis and summary report of these monitoring efforts is planned for 1982.

Conclusion for Alternative A (Biological)

The evidence gathered to date (Sections I.C.2.b. and IV.C.2.) indicates that with the stipulation imposed no significant impact is likely to occur to biologically sensitive areas in general, but the Flower Garden Bank tracts would be exposed to a greater threat than the present leasing and production levels pose.

Cumulative Impact for Alternative A (Biological)

No detrimental impact to live bottom and biologically sensitive areas has been documented for past activities, and since no significant impact is expected to result from this proposal, the cumulative impact to such areas will also be insignificant. Additionally, BLM-funded monitoring studies are continuing at the East and West Flower Garden Bank; these studies have been carried out over the past six years and to date no impacts due to the nearby oil and gas operations have been detected. Furthermore, over two years of industry-funded monitoring of a production platform drilling off south Texas has failed to show any detriment to the biota due to that drilling on the nearby bank.

(2) Other Alternatives

(a) Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas)

Because concern was expressed by other agencies regarding these biologically sensitive areas, these tracts are included as a deletion option. Alternative B-1 would delete all 126 tracts on which a biological stipulation would be imposed if leased. (See Table IV-9 for the resource basis associated with this alternative.) One hundred and seven tracts are off the Florida coast and the remaining 19 are located in the central and western Gulf of Mexico. These tracts represent about 27% of all tracts being considered in this proposal.

Conclusion for Alternative B-1 (Biological)

Adoption of this deletion option will remove any threat to live bottom and biologically sensitive areas posed by this proposal. However, with the imposition of the appropriate biological stipulation, no significant impact is expected to occur.

Cumulative Impact for Alternative B-1 (Biological)

Adoption of this deletion option will certainly remove any threat to live bottom and biologically sensitive areas posed by this proposal and negate any cumulative impacts which could have resulted. However, with the imposition of the appropriate biological stipulation, no significant cumulative impact is expected to occur.

(b) Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters)

The tracts associated with this alternative are located in areas of the Gulf of Mexico which do not exhibit biologically sensitive areas.

Conclusion for Alternative B-2 (Biological)

Since these 59 tracts are not located near any live bottom or biologically sensitive areas, deletion of these tracts will not change the overall environmental impacts to the biological impacts of Alternative A.

Cumulative Impact for Alternative B-2 (Biological)

Since these 59 tracts are not near any live bottom or biologically sensitive areas, deletion of these tracts will not change the overall environmental cumulative impacts to the biological impacts of Alternative A.

(c) Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts)

These 21 tracts offshore Mississippi/Alabama all have the stipulation attached that will protect any live bottom areas which might be adversely impacted by oil and gas operations. As such, they are also included in Alternative B-1 above. Again, Table IV-9 gives the resource basis associated with this alternative. These tracts represent 4.5% of all tracts being considered in this proposal.

Conclusion for Alternative B-3 (Biological)

To the extent that live bottom areas will be impacted by oil and gas operations, deleting them from the proposed sales would remove this threat. However, with the imposition of the live bottom stipulation, no significant impact is expected to occur.

Cumulative Impact for Alternative B-3 (Biological)

Because of the biological stipulation, no significant cumulative impact is expected.

(d) Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks)

Conclusion for Alternative B-4 (Biological)

Deletion of the tracts would remove any threat to biologically sensitive areas in this region.

Cumulative Impact for Alternative B-4 (Biological)

Cumulative impacts that could result from development of these tracts would be negated.

(e) Alternative C (Delay the Sales)

The sales could be delayed for an indefinite period of time because of an unforeseen situation which may occur before the sales occur.

Conclusion for Alternative C (Biological)

During the period of the delay, all impacts to biologically sensitive areas discussed in Alternative A will be held in abeyance.

Cumulative Impact for Alternative C (Biological)

There will be no additive impacts during the delay period.

(f) Alternative D (Withdraw the Sales - No Action)

Withdrawing the sales equates to taking no action; therefore, the potential for development of tracts within the scheduled time frame is foregone as is the economic considerations discussed in Alternative C of the proposal.

Conclusion for Alternative D (Biological)

This alternative will eliminate all biological impacts associated with Alternative A.

Cumulative Impact for Alternative D (Biological)

Withdrawing the sales will eliminate any environmental and cumulative impacts associated with the proposal.

(g) Alternative E (Reoffering of Tracts from Sales A66 and 66)

Since tracts for this alternative are unknown at the present time, the environmental consequences will be analyzed when the tracts are identified (Section II.E.).

b. Impact on the Florida Manatee

(1) Alternative A (Hold the Sales as Proposed)

Section 7 consultations (Endangered Species Act, see Section I.D.2.b.) have been held with FWS and NMFS for proposed oil and gas leasing and exploration activities in the Gulf of Mexico OCS region. The biological opinions resulting from these consultations are printed in Appendix E of the DEIS. The biological opinions indicate that leasing and exploration activities associated with this proposal are not likely to jeopardize the continued existence of the listed species considered in the consultations or result in the destruction or adverse modification of their critical habitats. However, the FWS biological opinion indicated that consultation must be reinitiated if there is any increased boating activity in congregation areas for manatees, if new manatee concentration areas are discovered in routes used on a regular basis by vessels servicing offshore activities, and if any oil and gas development activity occurs in the Florida area following the exploratory operations. Manatee habitat encompasses the majority of coastal Florida and specific critical habitat areas have been designated for the manatee (FR 41 (187): 41916). A 1979 survey by FWS found 50 manatees in the Alafia River area about 20 miles north of Port Manatee. This is about 5% of the 750-900 manatees estimated to occur in Florida coastal waters. Port Manatee, Florida, is a deepwater (ca. 35 ft) port on the southeastern shore of Tampa Bay which is used as a temporary (2-6 months) service base by offshore drilling operators. Service vessels make about 3-7 trips/week out of Port Manatee to offshore drilling rigs when there is drilling activity offshore southwestern Florida. These service vessels traverse a deepwater channel (ca. 34-40 ft) southwest out through Tampa Bay and into the Gulf of Mexico. This offshore service vessel traffic represents about 5% of the annual vessel traffic into Port Manatee. This increased vessel traffic could result in manatee mortality due to collisions with these vessels if they traverse the shallow water manatee habitat area north of Port Manatee. It is not expected that offshore service vessel traffic will affect the manatee population in this area; however, manatee injury or death could occur. Because of this potential occurrence and to alert the lessees to this potential problem, BLM will include an "Information to Lessees" in the Notice of Sale for proposed Sales 67 and 69 as follows:

> "Bidders are advised that the Florida manatee (sea cow) is a marine mammal which is officially listed as an endangered species by the Department of the Interior. It is protected by the Endangered Species Act of 1973, as amended (86 Stat. 1027, 16 U.S.C. 1531-1534), the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407, 50 CFR Part 216), and various other federal and state laws and regulations. On October 22, 1979 (44 FR 60963), Interior promulgated regulations (50 CFR 17.100-17.108) providing a means for establishing manatee protection areas. Also, there is the Florida Manatee Sanctuary Act of 1978 declaring the entire State of Florida as 'refuge and sanctuary for the manatee.' A cooperative agreement between Interior and Florida on endangered species became effective on June 23, 1976."

In addition to collisions with offshore service vessels, oil spills could have a minor effect on manatees. The probability of one or more oil spills (greater than 1,000 bbls) occurring and contacting manatee habitat along the west Florida coastal area is less than 0.5% within 30 days during the average production life (13 years) of these proposed lease tracts.

Conclusion for Alternative A (Florida Manatee)

It is concluded that offshore service vessel collisions with manatees and potential oil spills as a result of this proposal have a very low probability of occurrence. Therefore, adverse impacts to manatees as a result of this proposal are expected to be negligible.

Cumulative Impact for Alternative A (Florida Manatee)

No manatee/vessel collisions have been reported as a result of previous offshore service vessel traffic to/from Port Manatee and none are expected as a result of this proposal because the level of activity is expected to be similar. No oil spills have occurred as a result of previous OCS oil and gas activities in the eastern Gulf region that could impact the manatees or their habitat and a minimal number (0.37) of oil spills are expected to occur as a result of this proposal.

(2) Other Alternatives

(a) Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas)

Alternative B-1 would delete 73 tracts within the Charlotte Harbor area and 4 tracts within the St. Petersburg area. These tracts would probably be serviced from Port Manatee, Florida. The other 49 biologically sensitive tracts would not be serviced from known manatee habitat areas. Since this alternative includes the same tracts with manatee habitat areas as Alternative A above, the descriptive discussion is identical to that given for Alternative A.

Conclusion for Alternative B-1 (Florida Manatee)

The deletion of these 126 tracts from the proposal will remove any potential impact of collisions between offshore service vessels and manatees in the Port Manatee area.

Cumulative Impact for Alternative B-1 (Florida Manatee)

No cumulative impacts to manatees will occur as a result of Alternative B-1.

(b) Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters)

Alternative B-2 would delete 59 deepwater tracts located in the central and western Gulf region. This is an area in which manatees are not known to occur, and none of these tracts would be serviced from any known manatee habitat areas.

Conclusion for Alternative B-2 (Florida Manatee)

Manatees are not known to occur within the 59 deepwater tracts area.

Cumulative Impact for Alternative B-2 (Florida Manatee)

Alternative B-2 will have no effect on manatees or their critical habitat areas because these tracts are located outside of known manatee habitat; therefore, no cumulative impacts involving manatee would occur as a result of Alternative B-2.

(c) Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts)

Alternative B-3 would delete 21 tracts within the Mobile area. This is an area where manatees rarely occur and none of these tracts would be serviced from any known manatee habitat areas.

Conclusion for Alternative B-3 (Florida Manatee)

Alternative B-3 will have no effect on manatees or their critical habitat areas because these tracts are located outside of normal manatee range.

Cumulative Impact for Alternative B-3 (Florida Manatee)

No cumulative impacts involving manatees would occur as a result of Alternative B-3.

(d) Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks)

Alternative B-4 would delete two tracts near the Flower Garden Banks, an area in which manatees are not known to occur, and these tracts would not be serviced from any known manatee habitat.

Conclusion for Alternative B-4 (Florida Manatee)

Manatees are not known to occur near the Flower Garden Banks.

Cumulative Impact for Alternative B-4 (Florida Manatee)

Alternative B-4 will have no effect on manatees or this critical habitat because these tracts are located outside of known manatee habitat; therefore, no cumulative impacts involving manatees would occur as a result of Alternative B-4.

(e) Alternative C (Delay the Sales)

Conclusion for Alternative C (Florida Manatee)

The Florida manatee is not likely to be adversely impacted by this proposal; however, this alternative would merely delay any potential impact.

Cumulative Impact for Alternative C (Florida Manatee)

No cumulative impacts are expected.

(f) Alternative D (Withdraw the Sales)

Conclusion for Alternative D (Florida Manatee)

By withdrawing the sales, any impact on the manatee would be precluded.

Cumulative Impact for Alternative D (Florida Manatee)

There would be no cumulative impact.

(g) Alternative E (Reoffering of Tracts from Sales A66 and 66)

Since tracts for this alternative are unknown at the present time, the environmental consequences will be analyzed when the tracts are identified (Section II.E.).

c. Impact on Recreational Fishing

(1) Alternative A (Hold the Sales as Proposed)

Recreational fishing is the major recreational activity which commonly extends out into the areas of the proposed 472 lease tracts. Some SCUBA diving also takes place offshore, especially in the central Gulf where underwater visibility in the nearshore marine environment is strongly influenced by the sediment and turbidity of the Mississippi and Atchafalaya Rivers. Experience has shown, especially in the central Gulf or those offshore areas where oil and gas development has been ongoing for several years, that production platforms function as excellent artificial reefs attracting and concentrating fish and, inevitably, sport fishermen.

Studies by Ditton and Graefe (1978) and Dugas, Guillory, and Fischer (1979) indicate oil and gas platforms are the most popular offshore sport fishing destination areas between the Mississippi Delta of Louisiana and Freeport, Texas.

Ditton and Graefe studied the offshore areas south-southwest of the Houston-Galveston-Freeport coastal area of Texas and determined that oil and gas structures attracted more recreational fishing than any other type of feature, natural or artificial. Specifically, 87% of the boats that fished offshore frequented oil and gas structures. Most offshore fishing boats stayed within 40 miles of shore even though many oil and gas structures exist over 90 miles offshore from the Freeport-Galveston shorefront. They also determined king mackerel, ling, and snapper were the principal target species for offshore artificial reef fishermen.

The study by Dugas, et al., concluded that petroleum structures or "rigs" not only provide excellent fishing but the best fishing in the central Gulf of Mexico. Included in their study was an access point intercept survey of the commercial charter boat sport fishery in the winter of 1978. The scope of this survey included the charter fleet in the Grand Isle vicinity. Their findings indicate rig fishing constitutes 99% of the charter fleet's fishing effort. Bottom fishing for trout and croaker was the most common rig-associated fishing; however, driftline fishing (20% of charter boat effort), especially for king mackerel, was very popular during certain seasons. Trolling for billfish or blue-water species takes place from 35-75 miles offshore where the number of offshore oil and gas structures in the Mississippi Delta region are less dense; however, blue-water fishermen were reported to troll close to oil and gas platforms whenever the opportunity was present.

Maumus Claverie (1979), an officer and long-time member of the New Orleans Big Game Fishing Club, has stated that exploratory rigs, as well as production platforms such as Shell's Cognac structure, which are installed in their historical blue-water fishing areas have enhanced fishing success. Furthermore, the nearshore structures have always been utilized as navigation landmarks. He noted that manned structures have provided much assistance to club members over the years. Most of the club's big game fishing is associated with the 100 fathom depth contour, and petroleum structures within this area are a prime focus of recreational fishing efforts.

The New Orleans OCS Office monitored the 1980 Grand Isle Tarpon Rodeo, one of south Louisiana's oldest and largest fishing tournaments. Results from an informal survey indicated 100% of the winning entries in the SCUBA Division were captured under oil and gas structures and 55% of the winning entries in the Shoreline Division were caught around oil and gas structures (Table IV-13). Although some big game fishermen said they caught their prize-winning fish in association with oil and gas structures, no percentage was determined because we lacked a clear definition on how close one has to be to a structure to be fishing by it.

It is becoming widely accepted in the Gulf of Mexico region that oil and gas production platforms function as excellent artificial reefs and are good for recreational fishing. Conventionally permitted, marine artificial reefs, which are increasing in the areas of the Gulf where there is little or no oil and gas activity, are spatially limited to the benthic, and in some cases, mid-water zones. Oil and gas platforms provide an additional surface zone artificial reef, thereby, concentrating the greatest possible array of marine niches which attract bottom, pelagic, predator, and prey species.

There remains professional debate on whether artificial reefs (petroleum structures) merely attract fish or actually stimulate fish production leading to an overall augmentation of biomass. Although both theories are likely to interrelate, recent studies (Stone, et al., 1979) provide increasing support for a basic theory of fish and wildlife management; that is, carrying capacity of any animal population is a function of habitat availability.

Even though oil and gas structures can increase habitat availability, they can also damage natural habitat during installation and pose some adverse pollution risk to the marine life in the vicinity of the structure from effluents associated with drilling and production activity, most notably from accidental oil spills.

Two major federally supported research efforts in the last few years have been aimed at investigating the fate and effects of chronic, low-level pollutants commonly associated with established production platforms in the Gulf of Mexico.

NMFS, in association with EPA, has conducted a multidisciplinary-multiyear environmental assessment of the effects of the Buccaneer Oil Field (BOF) on the marine environment. The BOF is located approximately 50 miles from Galveston, Texas, and encompasses almost 15,000 acres under lease since 1960. Significant quantities of oil have been produced in the BOF; however, current production is primarily gas. Besides the permitted disposal of formation waters (brine) and other well and platform associated effluents, the largest recorded accidental oil spill over the life of the field involved three barrels (126 gallons) in 1973 with other minor incidences having occurred throughout the life of the field. The BOF has become a major sport fishing and SCUBA destination area. Ditton and Graefe's study in 1978 determined 21% of the offshore fishing trips by boats from the Houston-Galveston-Freeport area fished the 17 structures and platforms associated with the BOF. Recreational interest in the BOF and its associated oil and gas structures is the primary reason a one square mile portion of lease Block 288 was once under consideration for a marine sanctuary. Conclusions from the 5-year study project (Gallaway, 1980) indicate low-level contaminants related to the BOF operations can be detected in the sediments, water column, and biota associated with the field; however, these contaminants were not indicated to have been significant and there was little evidence of bioaccumulation. Therefore, public consumption of fish caught in close association with normal oil and gas operations pose little or no threat to human health.

Table IV-13

1980 Grand Isle Tarpon Rodeo
Winning Fish Caught Next to Oil and Gas Structures

Species	1st Place			2nd Place			3rd Place		
	Weight Lbs	oz.	Caught Next O&G Str.	Weight Lbs.	oz.	Caught Next O&G Str.	Weight Lbs.	oz.	Caught Next O&G Str.
BIG GAME DIVISION									
Tarpon	131	12	½ mile	130	0	*	126	8	*
Blue Marlin	616	8	*	319	4	Yes	60	8	No
White Marlin	156	4	Yes	139		*	89	6	No
Sailfish	60	15	1 mile	*			*		
Wahoo	84	10	*	79	0	No	63	10	No
Dolphin	42	0	No	*			*		
Blackfin Tuna	23	1	No	*			*		
Yellowfin Tuna	164	4	*	156		*	139	6	No
Shark	496	0	Yes	110	12	Yes	*		
SHORELINE DIVISION-55%									
Amberjack	85	4	Yes	78	4	Yes	76	12	*
Barracuda	29	12	Yes	18	8	Yes	18	8	Yes
Bluefish	6	7	Yes	6	3	*	6	1	Yes
Bonito	16	9	Yes	15	2	Yes	13	3	Yes
Catfish	7	6	Yes	7	3	No	7	3	No
Cobia	52	12	Yes	48	8	No	38	4	Yes
Croaker	3	9	*	3	4	*	3	3	Yes
Dolphin	42	0	No	*			*		
Drum	46	4	No	44	12	No	41	8	No
Flounder	2	12	Yes	2	8	No	2	4	Yes
Jack Crevalle	39	12	Yes	35	0	*	32	0	Yes

Table IV-13 (cont.)

SHORELINE DIVISION (cont.)

King Mackerel	62	0	Yes	57	12	Yes	55	0	No
Spanish Mackerel	6	2	Yes	6	2	Yes	5	5	Yes
Redfish	33	0	No	32	12	No	32	12	No
Red Snapper	26	12	Yes	20	8	Yes	18	10	Yes
Shark	496	0	Yes	110	12	Yes	*		
Sheepshead	6	11	No	6	0	No	5	14	No
Spadefish	6	5	Yes	6	0	Yes	5	8	Yes
Speckled Trout	5	10	No	5	5	No	4	11	No
Tripletail	7	6	Yes	6	1	Yes	5	6	No
Blackfin Tuna	21	3	No	*			*		
White Trout	6	9	Yes	3	13	Yes	3	12	Yes

SCUBA DIVISION-100%

Amberjack	63	12	Yes	63	0	Yes	62	8	Yes
Barracuda	33	12	Yes	31	12	Yes	31	0	Yes
Cobia	30	0	Yes	29	8	Yes	27	0	Yes
Grouper	61	8	Yes	45	0	Yes	41	8	Yes
Jack Crevalle	42	1	Yes	35	12	Yes	34	12	Yes
Jewfish	186	4	Yes	*			*		
Shark	26	4	Yes	*			*		
Snapper	24	12	Yes	22	0	Yes	22	0	Yes
Sheepshead	8	1	Yes	6	5	Yes	6	4	Yes

* Asterisk indicates either the winner was unavailable to declare source of his prize fish or no entry made in category.

A second major study begun in 1978 and directed by Southwest Research Institute (Bedinger, 1980) under contract to BLM involves the ecological investigations of established oil and gas production platforms in the central Gulf of Mexico. Selected sampling stations included production platforms scattered throughout the oldest and most heavily developed offshore area in the world. As in the NMFS study of the BOF, BLM's study was aimed at understanding the long-term chronic and cumulative effect of oil and gas development on the marine environment. Preliminary conclusions from this study indicate long-term contamination of the area by hydrocarbons can be documented, but the long-term residual buildup of hydrocarbon loading is low; no significant biological effects have occurred. Furthermore, natural perturbations noted during this study led to the conclusion that Mississippi River flooding and storms can have a much greater influence on normal populations than current industrial development off the Louisiana OCS. The researchers noted that production platforms are concentration sites for marine life and act as focal points for fish and fishing. Platforms create far more hard substrate than they destroy, if any, during exploratory drilling and platform installation. This augmented substrate provides for the development of a rich and diverse biofouling community which stimulates and focuses fishing activities until the structures are removed.

Of the 472 tracts included in the proposed sales, 305 tracts (approximately two-thirds) are located in the central and western Gulf interspersed within the most active lease and production areas in the Gulf of Mexico. As noted in Table IV-14 below, approximately 3,500 individual oil and gas structures and structure complexes already exist throughout the central (Louisiana) and western (Texas) Gulf.

Table IV-14

Offshore Petroleum Structures
Gulf Of Mexico

January 1, 1979[1]

	Multi-Well	Single Well	Others	Total
Louisiana	*(62) 889	2,008	203	3,100
Texas	(18) 77	158	6	241
TOTAL	996	2,166	209	3,341

*( ) Number of platforms installed during 1978.

[1] According to the March 17, 1980, Ocean Construction Report, 162 platform jackets and 90 caissons were set in the Gulf of Mexico in 1979; at the beginning of 1980, an additional 80 were under construction and another 66 were in the design or planning stage. Currently, platforms range from the shoreline to 131 miles offshore in water just a few feet deep to 1,025 feet. USGS indicated 34 platforms were removed from the Gulf in 1979. An average of about 40 platforms a year have been removed over the last five years. At the end of 1979 there were 1,732 active leases with 998 producing oil and/or gas.

Approximately one-third, or 167 tracts, are located in the eastern Gulf where oil and gas production has yet to begin. Considerable industry interest in the last few years has led to some leasing in the general vicinity of the 167 tracts under consideration in the eastern Gulf (Upper Gulf and Florida Shelf-see Visual 1). Exploration has recently begun on some of the active leases in the eastern Gulf.

Within the tract grouping located 12-20 miles south of Gulf Shores, Alabama, two tracts included in the proposed action for Sale 69 (tracts 123 and 128) have existing permitted (officially designated) artificial fishing reefs. These are the Sparkman and Wallace Liberty ship reefs. These permitted reef sites comprise only a small portion of the lease tract. Should these tracts be leased, regulations would require exploration or development operations to avoid the developed reef sites. Indirect adverse effects on recreational activities from exploration and development activities within these lease blocks should cause only temporary threats to full recreational enjoyment of the existing artificial reef areas. Noise, turbidity, and pollution could adversely affect the existing reef sites and their users. Many factors, most of which are unpredictable, would affect the gravity of these adverse impacts should they occur. Oil and gas operations within these lease blocks could also serve as an aid to navigation for fishermen attempting to locate the existing artificial reef sites and provide a source of emergency assistance for those utilizing the vicinity for recreational activities. Should commercial discovery of hydrocarbons be made in tracts 123 and 128, production platforms would enhance the recreational utility of the area for 10-30 years within the vicinity of the Sparkman and Wallace Liberty reefs.

These sales are expected to add 30 structures to the Gulf of Mexico. It is estimated that approximately 7 of these structures would relate to the tracts in the eastern Gulf and 23 in the central and western Gulf. Although all structures in the Gulf will function as artificial reefs, the degree to which they affect recreational fishing is believed to be related to the size of the structures erected, the length of time they are in place, and their distance from shore and principal access areas. Water depth, oceanic conditions, and bottom types around an offshore platform should also affect fishing potential associated with these structures. BLM is conducting a study at this time which should enhance our understanding of how oil and gas structures affect fishing patterns.

A study by LGL Ecological Research Associates (1980) under BLM Contract AA551-CT8-17 investigated the artificial reef effects of production platforms in the central Gulf of Mexico. Study findings resulted in the classification of Louisiana offshore platforms into three major ecotones based on depth contour, water conditions, and faunal characteristics—coastal (shore to 27 m), offshore (37-64 m), and blue-water (64 m and deeper). Platforms in the coastal ecotone are under significant impact from terrestrial runoff and include numerous species dependent on estuaries during their life cycle. The trout-croaker recreational catch so common in the commercial charter boat sport fishery as noted by Dugas, et al. (1979) is typical of the zone. Bivalves and shorefishes were abundant at platforms in the offshore zone but were supplemented by rich Caribbean fauna, such as the snapper so highly prized by the recreational fishermen. Caribbean fauna or tropical fishes and shellfishes (spiney lobster, for example) and corals were noted in association with platforms in the blue-water zone.

Except for the previous discussion on trolling for big game fish, very little is known about the scope and extent of recreational activity occurring around platforms in the blue-water zone in the central Gulf. Because the 200 m contour lies within 12-15 miles from the passes at the mouth of the Mississippi River, a new recreational horizon is becoming readily accessible to New Orleans-Baton Rouge area fishermen and SCUBA divers as a result of deepwater oil and gas development. A similar type recreation experience would require travel off the coast of Florida or to the Flower Garden Banks, a distance of more than 500 miles in either direction.

Production platforms may remain in place for 10-30 years with drilling activity occurring in only a few of those years. Generally, the longer an offshore structure remains on location, the more likely it will become a known and utilized sport fishing location. Eventually, when structures that result from this proposal are removed, as required by regulation, some adverse impact to the fish and fishing can be expected. In the developed areas of the central and western Gulf, this should cause little public concern because many structures are being installed and very few are being removed. It has been estimated that an average of 40 structures a year are removed from the OCS; whereas, in 1979 approximately 150 were added. Ultimately, however, all structures must be removed, and over the very long term the benefits to recreational fishing associated with offshore oil and gas development will be eliminated.

It has been noted in the central Gulf of Mexico that the exceptionally good fishing associated with oil and gas platforms entices some boaters with little offshore experience, without adequate safety equipment, and in adverse weather conditions to venture seaward beyond the capability of their vessels. As this phenomenon continues and expands with increased development involving new areas further from shore, additional burdens can be expected on the environment, the petroleum industry, the Coast Guard's boating safety programs and other agencies involved with the public offshore. BLM hopes to publish marine recreational maps which will help overcome some of the safety problems inherent in the OCS leasing program.

Conclusion for Alternative A (Recreational Fishing)

This proposal should enhance the offshore recreational fishing potential by creating artificial reefs which will concentrate sport fishing targets within leased tracts (65 maximum potential platforms, 30 expected), especially in the nearshore tracts most accessible to the recreational fishermen. Even though current operational practices and accidental pollution events associated with production platforms are known to contribute low-level contaminants to the environment, these contaminants are not expected to cause adverse health consequences to recreational users attracted to these structures.

Cumulative Impact for Alternative A (Recreational Fishing)

Ongoing oil and gas development in the central and western Gulf of Mexico has resulted in a special recreational fishery that will endure as long as development continues. Concomitant with development is the economic benefits realized in conjunction with associated recreational fishing, such as larger and possibly more boat and trailer sales, charter boat rentals, specialized fishing supplies, and enhancement of coastal support industries such as marinas and restaurants. This proposal is expected to extend and expand that recreational fishery. As new areas of the Gulf (eastern Gulf and deepwater environments) are successfully explored and developed, new recreational fishing opportunities will follow and become a more important element in the focus of offshore recreational fishing.

(2) Other Alternatives

(a) Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas)

Of the 126 biological tracts, 107 are located in the eastern Gulf (east of the Mississippi Delta). Thirty of these tracts are from 3-20 miles south of the Mississippi/Alabama coast and 77 are situated more than 60 miles seaward of the Tampa Bay/Charlotte Harbor areas. The remaining 19 tracts are known prominent topographic features associated with the continental shelf break off Louisiana and Texas. There are only eight platforms (artificial reefs) projected to result from the 126 biological tracts should they be offered for lease in Sales 67 and 69. Except for the 30 tracts located 3-20 miles south of the Mississippi/Alabama border (2-3 projected platforms), very little recreational fishing is believed to be currently associated with the other 77 tracts in the eastern Gulf and the 19 biological tracts in the central and western Gulf because of their great distances from shore.

Conclusion for Alternative B-1 (Recreational Fishing)

Removal of the 126 biological tracts from Sales 67 and 69 are unlikely to have a noticeable impact on recreational fishing except in the Mississippi/Alabama nearshore areas where 2-3 production platforms that could contribute to the area's attractiveness as recreational fishing locations would not be realized.

Cumulative Impact for Alternative B-1 (Recreational Fishing)

Since there is no plan describing the ultimate number and location of artificial reef sites in the Gulf of Mexico, it is difficult to make a cumulative impact determination. Over 120 specifically designated (permitted) artificial reefs have been constructed in the Gulf of Mexico to date and over 100 of those are in the eastern Gulf, two of which are in two of the biological tracts included in this alternative.

(b) Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters)

These 59 tracts are located in water depths greater than 400 m. The only recreational fishing likely to be associated with these water depths is blue-water, big game, or billfishing where the tracts are located within 75 miles of shore. Five production platforms are estimated to result from offering these 59 deepwater tracts in Sales 67 and 69, and these platforms are likely to attract tropical Caribbean fishes and billfish.

Conclusion for Alternative B-2 (Recreational Fishing)

The 13 tracts off the Mississippi Delta, especially those associated with the Mississippi Canyon, are the only deepwater tracts where an interaction between current active big game fishing areas and deepwater oil and gas development is likely. If the one or two platforms likely to be associated with these tracts were eliminated from this proposal, some potential enhancement of recreation benefits will be forgone in this vicinity.

Cumulative Impact for Alternative B-2 (Recreational Fishing)

Deleting 59 deepwater tracts will not affect the cumulative consequences of OCS oil and gas development on recreational fishing.

(c) Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts)

Two designated and permitted artificial reefs already exist within the 21 Mississippi/Alabama nearshore tracts. Exploration activity in close proximity to these artificial reefs may cause temporary changes in water conditions around the artificial reefs during drilling activity. Should commercial discoveries be encountered, production structures will be installed.

Conclusion for Alternative B-3 (Recreational Fishing)

It is unlikely that recreational fishing activity will be adversely affected by including 21 tracts in the proposal; however, commercial discoveries will lead to development of new artificial reef material which will enhance recreational fishing in the vicinity of the structures.

Cumulative Impact for Alternative B-3 (Recreational Fishing)

Inclusion of these 21 tracts will have little or no perceptible impact on recreational fishing trends in the Gulf of Mexico.

(d) Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks)

Deletion of the two tracts near the Flower Garden Banks would prevent the potential construction of artificial reef structures.

Conclusion of Alternative B-4 (Recreational Fishing)

Deletion of these two tracts is unlikely to have any effect on recreational fishing.

Cumulative Impact for Alternative B-4 (Recreational Fishing)

Deletion of these two tracts and the potential lack of construction of artificial reef structures will have no perceptible impact on recreational fishing trends in the Gulf of Mexico.

(e) Alternative C (Delay the Sales)

Delaying the sales would also delay the potential development of approximately 30 platforms or high profile artificial fishing reefs and the effects such development would have on recreational fishing, as stated above in Alternative A, until the sales are reinstated.

Conclusion for Alternative C (Recreational Fishing)

This alternative will not cause any environmental impacts until each sale is reinstated, at which time the environmental impacts discussed under Alternative A will be the same.

Cumulative Impact for Alternative C (Recreational Fishing)

Delaying these sales will delay but not eliminate the growth of rig fishing in the Gulf of Mexico.

(f) Alternative D (Withdraw the Sales - No Action)

Withdrawing the sales would have little noticeable short-term effect on the recreational fishing patterns currently existing in the Gulf of Mexico. The potential for increasing the number of artificial reefs developed by industry would be forgone within the 472 tracts included in Sales 67 and 69.

Conclusion for Alternative D

Withdrawing the sales will eliminate any environmental impact and forgo the development by private industry of offshore structures which have proven to be of intense interest and value to recreational fishermen when accessible.

Cumulative Impact for Alternative D (Recreational Fishing)

Continued withdrawal of OCS lease sales will result in long-term decline and lack of expansion of offshore petroleum structures which is likely to result in greater demands for public support of offshore artificial reef developments.

(g) Alternative E (Reoffering of Tracts from Sales A66 and 66)

Since tracts for this alternative are unknown at the present time, the environmental consequences will be analyzed when the tracts are identified (Section II.E.).

d. Impact on Coastal and Marine Birds

(1) Alternative A (Hold the Sales as Proposed)

Coastal and marine birds are discussed in Sections III.B.1.b., III.B.2.b., and III.B.3.b. As a result of this proposal, adverse impacts could occur to bird species from two general impact factors: oil spills and facility construction near feeding/nesting areas.

Oil spills can affect bird species by several routes: ingestion of oil contaminated food which could result in poisoning or sublethal physiological abnormalities, egg-laying could be inhibited, plumage could be oiled resulting in death, or oil could be transferred to eggs reducing hatchability.

Coastal bird species (herons, egrets, ibis, gulls, terns, loons, pelicans, etc.) could be impacted by oil spills as a result of this proposal. The bird species most vulnerable to oil spills are those which dive into the water to feed (i.e., brown pelicans) and those which roost on the water (i.e., common loon, *Gavia immer*). Habitats of selected endangered bird species are indicated on Visual 3 (DEIS A66 and 66), and additional data on endangered bird species are included in Appendix E of the DEIS.

The oil spill model prepared for this proposal indicates an expected 0.37 oil spills and a estimated probability of 0.19% that land will be contacted by one or more oil spills that have been at sea less than 30 days. Potential oil spills resulting from this proposal have a very low probability of reaching brown pelican habitat (4% within 30 days), Mississippi sandhill crane habitat (1% within 30 days), and whooping crane habitat (less than 0.5% within 30 days). However, oil spills from existing and proposed lease tracts (a potential cumulative impact) have a higher probability of reaching the above habitats: 78% for the brown pelican, 3% for the Mississippi sandhill crane, and 2% for the whooping crane; primarily as a result of existing waterborne transportation of crude oil (Appendix D of the DEIS, Tables 11 and B-1).

Marine species (boobies, gannets, petrels, shearwaters, etc.) spend the majority of their life offshore in the shelf, slope, and deep oceanic regions of the Gulf of Mexico and seldom occur in the coastal zone except to nest or when blown inshore by storms. Marine birds are very vulnerable to oil spills because they feed and roost on the water surface. A significant number of oil-fouled boobies washed ashore in Texas during the Ixtoc oil spill even though boobies are not common in Texas OCS areas. As discussed above, there is a very low number of oil spills expected (0.37) to result from this proposal; however, oil spills from existing lease tracts and transportation could have a moderate adverse impact on marine birds.

Facility construction near bird feeding/nesting habitat would primarily affect coastal bird species. Disturbance during the nesting season could cause nest abandonment and/or permanent site abandonment. New facilities projected for this proposal indicate that 1-2 pipeline landfalls and 1-2 storage/transfer facilities may be constructed in the eastern Gulf region. Currently, no specific construction sites have been selected; therefore, no site-specific impacts will be discussed. However, it is likely that any new facility construction would occur near areas of existing coastal development (i.e., Mobile and/or Tampa Bay areas) and adverse impacts to existing coastal bird feeding/nesting habitat would be minimal.

Conclusion for Alternative A (Coastal and Marine Birds)

Potential oil spills and facility construction resulting from this proposal will have a minimal impact on coastal and marine birds.

Cumulative Impact for Alternative A (Coastal and Marine Birds)

Cumulative impacts of this proposal and existing oil/gas production and transportation are projected to be a moderate adverse impact from oil spills, especially to the brown pelican, and a minimal impact from facility construction to coastal and marine birds.

(2) Other Alternatives

(a) Alternative B-1 (Deletion of 126 Tracts Near Biologically Sensitive Areas)

This alternative would delete 126 tracts and about 32% of the estimated oil (conditional mean) from this proposal. Of the 126 biologically sensitive tracts, 107 (live bottom areas) are located in the eastern Gulf (east of the Mississippi River Delta); 30 of these tracts are from 3-20 miles south of the Mississippi/Alabama coast and 77 are situated more than 60 miles seaward of the Tampa Bay/Charlotte Harbor areas. The remaining 19 tracts are known prominent topographic features associated with the continental shelf break off Texas and Louisiana.

Deletion of these 126 tracts could: (1) preclude oil and gas activities in 30 nearshore tracts which would moderately (about 10%-20%) reduce the potential oil spill risk to coastal birds and their habitat in this area; (2) preclude oil and gas activities in 90 offshore tracts which would moderately (about 20%-40%) reduce the potential oil spill risk to marine birds and their habitat, especially in the Florida Shelf area; and (3) preclude oil and gas activities in the 30 Upper Gulf and 77 Florida Shelf tracts which would remove any potential adverse impacts of onshore facility construction to coastal birds and their habitat.

Conclusion for Alternative B-1 (Coastal and Marine Birds)

Alternative B-1 will moderately reduce any adverse effects of potential oil spills to coastal and marine birds and their habitat, especially in the eastern Gulf region. Also, this alternative would remove any potential adverse impacts to coastal birds and their habitat from onshore facility construction in the eastern Gulf region as a result of this proposal.

Cumulative Impact for Alternative B-1 (Coastal and Marine Birds)

No major cumulative impacts to coastal and marine birds have been recorded from previous OCS oil and gas activities in the eastern Gulf region. However, it is reasonable to assume a minor reduction in potential cumulative adverse impacts to coastal and marine birds as a result of deleting these 126 tracts from this proposal.

(b) Alternative B-2 (Deletion of 59 Tracts with Water Depths Greater than 400 Meters)

This alternative would delete 59 tracts and about 25% of the estimated oil (conditional mean) from this proposal. These tracts range from 35-140 nmi offshore Louisiana and Texas in water depths greater than 400 m. The majority of these tracts are scattered along the continental slope offshore Louisiana and Texas.

Deletion of these 59 deepwater tracts could: (1) preclude a minor potential for oil spill impacts to coastal birds and their coastal habitat and (2) preclude oil and gas activity in 59 offshore tracts which could moderately (about 15%-30%) reduce the potential oil spill risk to marine birds and their habitat, especially in the Louisiana/Texas Gulf region.

Conclusion for Alternative B-2 (Coastal and Marine Birds)

Alternative B-2 will minimally reduce any adverse effects of potential oil spills to coastal birds and moderately reduce adverse oil spill impacts on marine birds and their habitat, especially in the Louisiana/Texas Gulf region.

Cumulative Impact for Alternative B-2 (Coastal and Marine Birds)

It is reasonable to assume a minor reduction in potential cumulative impacts to marine birds as a result of deleting these 59 tracts from this proposal.

(c) Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts)

This alternative would delete 21 tracts and about 5% of the estimated oil (conditional mean) from this proposal. These tracts are grouped together about 3-9 nmi off the coasts of Mississippi and Alabama.

Deletion of these 21 tracts would preclude oil and gas activities which would minimally (about 5%-15%) reduce potential oil spill impacts on coastal birds and their nearshore habitat in the Mississippi/Alabama area.

Conclusion for Alternative B-3 (Coastal and Marine Birds)

Alternative B-3 will minimally reduce any adverse impacts of potential oil spills on coastal birds in the Mississippi/Alabama coastal areas.

Cumulative Impact for Alternative B-3 (Coastal and Marine Birds)

No cumulative impacts to coastal birds or their habitat have been recorded from previous OCS oil and gas activities in this Mississippi/Alabama area. However, it is reasonable to assume a minor reduction in potential cumulative impacts to coastal birds and their habitats as a result of deleting these 21 tracts from this proposal.

(d) Alternative B-4 (Deletion of 2 Tracts Near the Flower Garden Banks)

This alternative would delete two tracts near the Flower Garden Banks and thereby reduce the potential oil spill risk to marine (pelagic) birds and their habitat.

Conclusion for Alternative B-4 (Coastal and Marine Birds)

Alternative B-4 would minimally reduce any potential risks from oil spills to marine birds and their habitat.

Cumulative Impact for Alternative B-4 (Coastal and Marine Birds)

It is reasonable to assume a minor reduction in potential cumulative impacts to marine birds as a result of deleting these two tracts from this proposal.

(e) Alternative C (Delay the Sales)

Conclusion for Alternative C (Coastal and Marine Birds)

Holding the proposed sales at a later date will postpone any adverse impacts on coastal and marine birds and their habitats.

Cumulative Impact for Alternative C (Coastal and Marine Birds)

No cumulative impacts are expected on coastal and marine birds and their habitats.

(f) Alternative D (Withdraw the Sales - No Action)

Conclusion for Alternative D (Coastal and Marine Birds)

Withdrawal of the sales will preclude all potential and expected environmental impacts on coastal and marine birds and their habitats.

Cumulative Impact for Alternative D (Coastal and Marine Birds)

There will be no cumulative impacts on coastal and marine birds and their habitats from this proposal if the sales are withdrawn.

(g) Alternative E (Reoffering of Tracts from Sales A66 and 66)

Since tracts for this alternative are unknown at the present time, the environmental consequences will be analyzed when the tracts are identified (Section II.E.).

2. *Impacts on Other Areas of Environmental Concern*

The scoping activities for the Gulf of Mexico region identified a number of environmental concerns which were not judged to be major or significant; thus, they do not require in-depth analysis in the EIS. The expected and potential impacts have been analyzed for each of these environmental concerns. In some cases the assessment was made in as great a depth as that for the major or significant issues. However, in accordance with CEQ's final regulations, these environmental concerns are given brief treatment in the EIS. The assessment made for each of these areas of environmental concern is summarized and briefly discussed in Appendix B of the DEIS. The categories or areas of environmental concern covered in Appendix B of the DEIS include the following:

- Biological Environment Categories
  - Fish and Wildlife
  - Amphibians
  - Birds

  - Endangered Species
  - Fish
  - Mammals
  - Reptiles
  - Plants
  - Algae
  - Plankton
  - Vascular Plants
  - Communities
  - Beaches and Barrier Islands
  - Estuaries and Embayments
  - Marshes and Wetlands
  - Hard Bottom and Biologically Sensitive Areas
  - Ecological Relationships
  - Ecosystem Functions
  - Nursery Ground Aspects
  - Succession
- Physical Environment Categories
  - Air Quality
  - Water Quality
- Social and Economic Environment Categories
  - Archaeological Resources
  - Commercial Fisheries
  - Military Warning Areas
  - Recreation
  - Tourism
  - Employment
  - Community Services and Facilities
  - Local Fiscal Balance
  - Land Use Compatibility/Conflicts
  - Marine Transportation
  - Local Business Activity

3. Effects of High Resource Scenario

It is possible that production could vary if anything other than the mean level of resources was recovered. More wells would have to be drilled and more production facilities would be required for the high case. In this instance, the development that was assumed for the most likely case (Sections IV.A. and IV.B.) and the additional development described below is assumed to occur. These assumptions should not be regarded as rigid productions for future events.

— Resources: It is assumed that the high level of resources estimates would be produced. (The combined high level resource estimates listed in Table IV-1 are used for this analysis.) This amounts to a total of 200.35 million barrels of oil (with peak production of 79,500 barrels per day) and 2,940.39 billion cubic feet of gas (with a peak of 1,233 million cubic feet per day). There will be 65 platforms and 7 subsea completions required to produce the resources. There would also be 450 exploratory wells and 500 development wells drilled.

— Transportation: Pipeline transportation would be used. Two oil pipelines totaling 280 miles offshore and two gas pipelines totaling 210 miles offshore would be needed.

— Oil Pipelines: The Upper Gulf oil trunk line would use the same landfall as assumed in the mean case; in the high case, however, the diameter would be larger and there would be two flow lines from the proposed lease area. The Florida Shelf oil trunk line would also have two flow lines originating from the proposed lease area which join at a point where a pumping and storage facility could be located, and then continue to shore. The landfall is assumed to be in the Mobile Bay area for the Upper Gulf line and in the Tampa Bay area for the Florida Shelf line. Any additional pipelines laid in the offshore Louisiana or Texas areas are assumed to be an extension of existing networks. The amount of pipeline expected to result is as follows:

Area	Pipeline Distance	Landfall
Louisiana	72 miles	None expected
Texas	72 miles	None expected
Upper Gulf	20 miles	Mobile Bay Area
Florida Shelf	80 miles	Tampa Bay Area

— Oil Storage and Pumping Station: The onshore oil storage and pumping station associated with the Upper Gulf oil pipeline is assumed to be located in the Mobile Bay area and has two tanks with a combined capacity of 1 million barrels. The onshore oil storage and pumping station associated with the Florida Shelf oil pipelines is assumed to be located in the Tampa Bay area and also has two tanks with a combined capacity of 1 million barrels.

— Oil Refineries: These will remain the same as projected for the mean case.

— Gas Pipelines: The two gas pipelines are assumed to be the same as those described for the oil pipelines (length of pipeline relative to offshore area, landfalls, and placement).

— Gas Processing Plants: Gas from the Upper Gulf pipeline may be processed in the Mobile Bay area and gas from the Florida Shelf pipeline in the Tampa Bay area. Each of the gas processing plants in this case would have a capacity of 1 million cubic feet/day.

— Operations Support Bases: These will remain the same as projected in the mean case.

Summary of Environmental Consequences (High Resource Estimate)

Assuming the high level of resources are recovered and transported to shore by pipeline, the degree of impact could double that described under Alternative A (mean resource estimate).

Even with the greater level of production, the effects of increased air emissions offshore would be temporary and localized, as pollutants would be rapidly diffused in the offshore air mass.

Impacts affecting the offshore environment from platform discharges, pipeline installation, and large oil spills could be approximately twice that expected under the mean case. A total of 2,602,691 barrels of drilling muds and 2,602,677 barrels of drill cuttings could be discharged under the high case. Subsea pipeline burial could disturb up to 3,814,054 cubic yards of sediments.

Biological resources would be exposed to a greater risk of impact under the high-level estimate. Planktonic and benthic communities could decrease temporarily if a significant decline in water quality occurred. Marine fish populations may be reduced from a probable increase in the number of large oil spills occurring over the life of the field. Fishing area lost to the commercial fishing industry from platforms and pipelines ranges from 1,566-4,700 acres (about 10 acres per developed tract) or a maximum of 0.2% of the total acreage. However, biological stipulations are considered adequate to protect the biota.

Sensitive coastal habitats could be degraded by construction of the four projected pipelines through sandy beach, barrier island, and/or coastal wetland areas. Oil spills from the two oil pipelines would have a moderate probability (0.49) of contacting portions of the Mississippi, Alabama, and Florida coasts. A higher number of spills in the lease area could also pose a threat to sensitive coastal habitats.

Adverse impacts to coastal and marine birds could be increased due to the probable increase in the number of large oil spills and increases in small chronic discharges from platforms. Population declines and high mortality rates could be expected, particularly for marine species.

The increased risk of oil spills could adversely affect endangered species. Brown pelicans in the Florida area could be exposed to a higher possibility of impact, particularly from pipeline spills. Endangered manatees, turtles, and whales could face an increase in the number of ship collisions as more vessels would be servicing the lease area. Drilling-related impacts could increase significantly as more than twice as many wells are projected under the high case than under the mean. Higher mortality rates and population reductions could result.

The onshore environment could suffer increased impacts from pollutants generated by the two additional gas processing plants, two additional oil pumping and storage facilities, and two additional pipelines. The potential impacts would not differ in kind from those described under Alternative A, but additional locations could be affected.

Increased impacts to air quality caused by the need for additional onshore facilities, particularly the gas processing plants, would depend on the sulfur content of any gas discovered.

Impacts to recreation and tourism could increase if the high resource estimate is recovered. Spills from either oil pipeline would pose a significant risk to sandy beach areas along the Mississippi, Alabama, and Florida coasts. There would also be an increase in the probability of a spill from the lease area impacting sandy beaches.

The additional onshore support facilities required for a high case find would probably not result in any major new land use conflicts since all facilities would be sited in accordance with applicable state and local land use policies. However, the conflicts noted under Alternative A would still occur.

Since the resource estimates associated with this high resource scenario are about double those of the mean resource scenario for both oil and gas, forecast impacts are correspondingly greater. The total jobs induced by the sale could total over 8,120 for the region in the peak year of 1984 should the high level of resources be developed. Impacts on local communities are also expected to be greater. Sale-induced jobs could increase by over 2,120 (versus 1,060 for the mean case) in the Gulf region.

Conclusion of Environmental Consequences (High Resoure Estimate)

If the high level of resources are recovered and transported to shore by pipeline, more severe adverse impacts to some of the biological resources of the eastern Gulf region could occur. The increase in severity of impacts over the mean case would be due to the greater amount of drilling discharges and increased risk of large oil spills. Coastal and marine birds and endangered whales, sea turtles, and manatees could suffer higher mortality rates and possible population declines.

Greater community disruption could be expected, and the "boom-bust" impacts on communities and counties would be correspondingly higher than those associated with a mean level of resource development. Conflicts over land use and potential adverse impacts to recreation areas could be doubled over those expected under the mean case.

4. Unavoidable Adverse Environmental Effects of the Proposal

Holding Sales 67 and 69 as proposed would have certain unavoidable adverse environmental effects on the Florida manatee. These effects are summarized in Section II.A.2.b. In addition, it has been concluded that: (a) the normal and routine activities of oil and gas exploration and development operations will produce no significant long-term adverse environmental effects, although in a few instances (pipeline construction, muds and cuttings disposal, etc.) short-term local adverse effects may result; and (b) nonroutine incidents, such as blowouts and oil spills, may produce signficant and longer-term adverse effects, depending on the location and size of the incident, but the likelihood of such an incident occurring in or near an area where the effects would be significant (in shallow water, near a shore, in wetlands, etc.) is statistically very small.

The unavoidable adverse environmental effects on the Florida manatee as discussed in Section IV.D.1.b., indicate that this proposal is not likely to jeopardize the existence of this endangered species although, there could be some damage to individual animals in the Tampa Bay area, especially in the summer, due to the increased boat traffic.

5. Irreversible and Irretrievable Commitment of Resources

Leasing of tracts in the proposed sales will permit development and extraction of the oil and gas resources contained therein. Mean estimates by USGS of net recoverable resources are 50.6 and 26.3 million barrels of oil and 912.6 and 614.1 billion cubic feet of gas for Sales 67 and 69, respectively. Production of these resources at this time precludes their use by future generations and constitutes an irreversible loss of petroleum resources.

During the period 1970-1978, a total of 139 fatalities and 212 major injuries occurred as a result of blowouts, fires, explosions, falls, vessel collisions or sinkings, drownings, electrocutions, etc., associated with offshore oil and gas activities on the OCS (USDI, GS, 1979a). During this same period, a total of 8,513 new wells was started (USDI, GS, 1979b). This gives us a measure of the rates of fatalities (1 per 61 new wells started) and injuries (1 per 40 new wells started) associated with drilling activities on the OCS. Assuming that the projected number of wells for the proposed sales is attained (total mean estimate of 670 exploration, delineation, and development wells for Sales 67 and 69 combined), we can estimate that 11 deaths and 17 injuries will occur during the 20 to 30-year projected life of Sales 67 and 69 wells. Such deaths and major injuries are an irretrievable loss of human resources. Although such incidents cannot be completely eliminated, they are minimized by continuous updating of OCS safety standards.

Additionally, we can attempt to estimate the resources committed and probable human losses as a result of previous lease sales in the Gulf of Mexico. USGS (Hewitt, Knipmeyer, and Schluntz, 1980) estimates that unproduced reserves on leased Gulf of Mexico tracts total 2.88 billion barrels of oil and 38.0 trillion cubic feet of gas. These estimates are about 37.3 and 24.9 times larger, respectively, than the mean estimates for combined Sales 67 and 69 resources, so we might assume that there would be approximately 37 times as many fatalities and accidents based on comparisons of projected oil production. This estimate is probably high, however, since some or all of the leased but unproduced reserves already have on-line production wells. In any event, this high estimate indicates that 407 deaths and 629 injuries are predicted as a result of present production in the Gulf of Mexico.

6. Relationship Between Short-term Use of Man's Environment and Maintenance and Enhancement of Long-term Productivity

As discussed previously in this section, the oil and gas operations as a result of this proposal will have a moderate, localized, and short-term effect on some of the living resources of the Gulf of Mexico OCS. Some plants and animals may be killed, and some habitat may be eliminated. Overall, the long-term effects on the biota are considered to be minimal. If all oil and gas operations were terminated, the biological communities would be expected to return to predrilling levels and compositions within 1-3 years in all localized areas except where large oil spills occur. Longer durations are indicated on benthic communities or intertidal areas affected by large spills. The oil spill risk analysis model (Appendix D of the DEIS, Tables 11 and B-1) predicts that many oil spills will occur and contact land within 30 days as a result of Sales 67 and 69 leases, existing leases (12 spills predicted), and existing transportation (11 spills predicted). However, none of these spills are predicted to result solely from proposed Sales 67 and 69. The most probable landfalls are generally in coastal Louisiana.

The induced development may result in short-term adverse impacts to communities. A strain on existing infrastructure would be expected if new sale-related facilities are located in areas of low population gains and induced industrial development is absorbed in the expanded communities. Land utilized for facilities directly associated with OCS operations will be excluded from other uses over the 30-year life of the field; however, only a portion of this land may continue to be so utilized after production ceases.

OCS development off Louisiana has supported recreational and commercial fishing activities. This has stimulated the manufacture and sale of larger private fishing vessels and specialized fishing and recreational equipment. Additionally, commercial enterprises such as charter boats have become heavily dependent on offshore structures for satisfying recreational customers. These proposed sales will increase these incidental benefits of offshore development. The 30 platforms expected to result from the proposed sales will help replace those currently being removed where production has terminated. As the incidence of offshore fishing and diving has gradually increased in the past three decades, platforms (the focus of much of that activity) will eventually begin to gradually decline as mineral resources become depleted. In order to maintain the long-term productivity of site-specific, artificial locations attractive to fishermen and divers, some means, such as proliferation of artificial reef development programs, will need to eventually replace platform removals.

Conclusion

The impacts of field development from these sales are expected to decrease biological productivity in some minor fashion for the short-term while enhancing economic activity. Ultimate long-term environmental productivity of the living resources is not expected to be significantly reduced. Industry-related platforms serve as short-term artificial reefs during their productive life. Rather than remove these structures, as is presently being done, a program is necessary to enhance long-term productivity.

Section V

Coordination and Consultation

V

V. COORDINATION AND CONSULTATION

A. Development of the Proposal

The development of a sale proposal follows a set of procedures in the leasing process to ensure adequate state, local, and other agency input to planning. The procedures required to develop a proposal are: Request for Resource Reports, Call for Nominations and Comments, Tract Selection, and the Tentative Announcement of Tracts. A discussion of these four elements is given in Section I.B.

During coordination with federal and state representatives, two formal coordination/tract selection meetings under the Intergovernmental Planning Program (IPP) were held at the New Orleans OCS Office. Regional Technical Working Group (RTWG) representatives and personnel from FWS participated. At the April 1, 1980 meeting, the results of the general Call for Nominations and Comments were presented, and environmental considerations of the general area, as well as some specific concerns, were discussed. The second meeting, held April 16, 1980, provided RTWG representatives an opportunity to examine and discuss the blocks suggested by field-level BLM and USGS offices. Summary sheets and a briefing map were prepared for this meeting. No specific objections were voiced concerning any of the tracts recommended as potential offers in these sales.

B. Development of the DEIS

1. Coordination and Consultation with Others

The CEQ regulations and the OCSLA Amendments require coordination and consultation with the states, public, and other federal agencies throughout the development of the EIS in order to determine the scope and significance of issues to be addressed in the statement. In an effort to determine concerns and potential issues relating to the Florida west coast, the following agencies were visited in July 1980 and their views solicited: Florida Department of National Resources, Tampa Bay Regional Planning Commission, Florida Institute for Oceanography, Port Operations for Port Manatee, and Southwest Florida Regional Planning Council. Additionally, field inspections of beaches and the coastal environment were conducted. On the basis of these contacts and visits, the following concerns and potential issues appeared: (a) coastal related tourist economy, (b) coastal recreation, (c) commercial fishing and related coastal and offshore ecosystems, (d) endangered and threatened wildlife (manatees and sea turtles), and (e) designated environmentally unique, sensitive, and/or important areas.

The Gulf of Mexico information transfer meeting held May 12-13, 1980, in New Orleans, Louisiana, contributed to scoping the EIS for proposed oil and gas Sales 67 and 69. The purpose of the meeting was an exchange of information; the goal of the meeting was to provide as much up-to-the-day information as possible relevant to environmental impact statements and environmental assessment reports. The data and information were available in the private and public sectors in the hands of various researchers or administrators. Since BLM did not have sufficient manpower to visit each of them, arrangements were made with the Texas A&M Research Foundation under BLM Contract AA551-CT8-35 for bringing together these researchers and preparing proceedings of the workshop. Over 75 industrial, educational, and governmental scientists and administrators, as well as the general public, attended the workshop. Through these contacts the issues and impacts relating to the proposed sales were determined and addressed in this DEIS.

The scoping procedures associated with these determinations are described in Section I.B. and the subsequent alternatives and environmental consequences are described in Sections II and IV, respectively. For a complete discussion of these areas, the reader is referred to those sections.

2. Distribution of the DEIS for Review and Comments

Copies of this DEIS were sent to the agencies and groups listed below for their review and comments during a 45-day comment period. An asterisk identifies those agencies and groups that commented on the DEIS.

Federal Agencies

- Advisory Council on Historic Preservation
- Department of the Air Force
- Department of the Army
  - * Corps of Engineers
- Department of Commerce
  - Environmental Affairs
  - National Marine Fisheries Service
  - National Oceanic and Atmospheric Administration
  - Office of Ecology and Environmental Conservation
- Department of Energy
  - * Federal Energy Regulatory Commission
  - Office of NEPA Affairs
  - Office of Regulatory Analyses
  - Technical Information Center
- Department of the Interior
  - * Bureau of Mines
  - * Fish and Wildlife Service
  - * Geological Survey
  - * Heritage Conservation and Recreation Service
  - * National Park Service
  - National Resources Library
  - Office of the Solicitor
- Department of the Navy
- Department of State
  - Office of Environmental Affairs
- Department of Transportation
  - Coast Guard
    - Environmental Protection Division
    - Environment, Safety, and Consumer Affairs
  - Federal Aviation Administration
  - Materials Transportation Bureau
  - Office of Safety Affairs
- *Environmental Protection Agency
- Federal Energy Regulatory Commission
- Gulf Regional Fishery Management Council
- *Marine Mammal Commission
- National Transportation Safety Board
- Nuclear Regulatory Commission
- Select Committee on the Outer Continental Shelf

State and Local Agencies

- Alabama
  - Governor's Office
  - A-95 Clearinghouse
  - Alabama Coastal Area Board
  - Alabama Coastal Zone Recreation and Tourism Specialists
  - Alabama Department of Conservation
  - Alabama Development Office

Alabama Geological Survey
Alabama Historical Commission
Alabama State Historic Preservation Officer
Alabama State Planning Officer
Alabama Water Improvement Commission
Mobile Office of Intergovernmental Relations
South Alabama Regional Planning Commission
Tombigbee Regional Commission

Mississippi
Governor's Office
A-95 Clearinghouse
Bureau of Marine Resources
Gulf Regional Planning Commission
Jackson County Planning Commission
Mississippi Bureau of Outdoor Recreation
Mississippi Cooperative Extension Service
Mississippi Department of Archives and History
* Mississippi Department of Wildlife Conservation
Mississippi Marine Resources Council Advisory Committee
Mississippi Natural Heritage Program
Mississippi Research and Development Center
Mississippi State Historic Preservation Officer
Southern Mississippi Regional Planning Commission

Louisiana
Governor's Office
A-95 Clearinghouse
Acadiana Regional Clearinghouse
* Department of Culture, Recreation, and Tourism
* Department of Natural Resources
Department of Transportation and Development, Coastal Resources Program
Department of Wildlife and Fisheries
Evangeline Economic Development District
Imperial Calcasieu Regional Planning Commission
Louisiana Cooperative Extension Service
Louisiana State Historic Preservation Officer
Metropolitan Regional Clearinghouse
New Orleans City Planning Commission
Office of Program Development
Office of Science, Technology, and Environmental Policy
Office of State Planning
* Regional Planning Commission for Jefferson, Orleans, St. Bernard, and St. Tammany Parishes
Secretary of State
South Central Planning and Development Commission
State Mineral Board
Teche Regional Clearinghouse

Florida
* Governor's Office
A-95 Clearinghouse
Apalachicola Regional Planning Council

- Central Florida Regional Planning Council
- Florida Audubon Society
- Florida Bureau of Coastal Zone Planning
- * Florida Department of Commerce
- * Florida Department of Natural Resources
- Florida Department of Transportation
- Florida Division of Economic Development
- Florida Division of Recreation and Parks
- Florida Institute of Oceanography
- Florida Office of Coastal Management
- Florida State Historic Preservation Officer
- Gulf Regional Fisheries Council
- * ManaSota 88
- South Florida Regional Planning Council
- * Southwest Florida Regional Planning Council
- Tampa Bay Port Authority
- * Tampa Bay Regional Planning Council
- West Florida Regional Planning Council
- Withlacoochee Regional Planning Council

Texas
- Governor's Office
- Coastal and Marine Council
- Coastal Bend Council of Governments
- Corpus Christi Parks Department
- Galveston County Parks Department
- General Land Office
- Golden Cresent Council of Governments
- Governor's Budget and Planning Office
- Houston-Galveston Area Council
- Lower Rio Grande Valley Development Council
- South East Texas Regional Planning Commission
- Texas Antiquities Commission
- Texas Coastal and Marine Council
- Texas Coastal Program
- Texas Department of Water Resources
- Texas Highway Department
- Texas Historical Commission
- Texas Legislative Committee to Study Texas Beaches
- Texas Parks and Wildlife Department

Academic Institutions

- Auburn University (Alabama)
- Battelle-Pacific Northwest Laboratories
- * Louisiana State University
- Louisiana University Marine Consortium
- Mississippi State University
- Texas A&M University
- Tulane University (Louisiana)
- University of Miami, Gulf and Caribbean Fisheries Institution
- University of South Alabama
- University of Texas, Marine Science Institute
- Virginia Institute of Marine Science
- Woods Hole Oceanographic Institute

Industrial Firms

- Brown and Root
- Chevron
- Clean Gulf Associates
- * Exxon Co., USA
- * Gulf Oil Exploration and Production Co.
- J. Ray McDermott
- National Ocean Industries, Inc.
- Offshore Operators Committee
- * Shell Oil Co.
- Texaco
- Zapata Offshore

Groups

- Alabama Conservancy
- Alabama Environmental Quality Association
- Alabama Ornithological Society
- Alabama Wildlife Federation
- American Fisheries Society
- American Sportsfishing Federation
- Citizens Environmental Coalition (Texas)
- Coast Alliance (Georgia)
- Coastal Bend Conservation Association
- * Defenders of Wildlife
- Environmental Information Center (Florida)
- ENVIROSOUTH INC. (Alabama)
- Florida Audubon Society
- Florida Conservation Council
- Florida Defenders of the Environment
- Florida Wildlife Federation
- Houston Sportsmen's Club
- International Game Fish Association
- Izaak Walton League (Florida)
- Louisiana Fisheries Federation
- Louisiana Wildlife Biologist Association
- Marine Wilderness Society (Louisiana)
- Mississippi Chapter, Sierra Club
- Mississippi Natural Heritage Program
- Mississippi Wildlife Federation
- National Audubon Society
- National Coalition for Marine Conservation (Georgia)
- Natural Resources Defense Council, Inc.
- * Sierra Club (Florida)
- Sierra Club, Gulf Coast Group
- Sierra Club (Texas)
- Southeastern Fisheries Council
- Sport Fishing Institute (Washington, D.C.)
- Sportsmen's Club of Texas
- Texas Bay and Gulf Fishermen Association
- Texas Environmental Coalition
- Welder Wildlife Foundation
- Wildlife Society Mississippi Chapter

C. DEIS Letters of Comments

1. U.S. Department of the Interior, Geological Survey
2. U.S. Department of the Interior, Fish and Wildlife Service
3. U.S. Department of the Interior, Fish and Wildlife Service
4. U.S. Department of the Interior, National Park Service
5. U.S. Department of the Interior, Bureau of Mines
6. U.S. Department of the Interior, Heritage Conservation and Recreation Service
7. U.S. Environmental Protection Agency
8. Federal Energy Regulatory Commission
9. Marine Mammal Commission
10. Department of the Army, New Orleans District, Corps of Engineers
11. Department of the Army, South Atlantic Division, Corps of Engineers
12. Department of the Army, Galveston District, Corps of Engineers
13. State of Florida, Office of the Governor
14. State of Florida, Office of the Governor
15. State of Florida, Office of the Governor
16. State of Florida, Department of Natural Resources
17. State of Florida, Department of Commerce
18. ManaSota-88
19. Southwest Florida Regional Planning Council
20. Southwest Florida Regional Planning Council
21. A-95 Clearinghouse Review
22. State of Louisiana, Department of Natural Resources, Division of State Lands
23. State of Louisiana, Department of Culture, Recreation and Tourism, Office of Program Development
24. Regional Planning Commission, Jefferson, Orleans, St. Bernard, St. Tammany Parishes
25. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources
26. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources
27. Shell Oil Company
28. Exxon Company, USA
29. Gulf Oil Exploration and Production Company
30. Louisiana State University, Coastal Ecology Laboratory, Center for Wetland Resources
31. Defender of Wildlife
32. Sierra Club - Coastal Task Force

United States Department of the Interior

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[illegible]

MAY 7 1981

Memorandum

To: Director, Bureau of Land Management (542)

From: Acting Assistant Director for Resource Programs

Subject: Review of draft environmental statement for proposed
Outer Continental Shelf Oil and Gas Lease Sales
Nos. 67 and 69, Gulf of Mexico

We have reviewed the draft statement as requested in your memorandum of March 20.

1-1 Page ii, paragraphs 3 and 7. Estimates for the two sales should be listed separately. Conditional mean resource estimates for the two sales are not additive. Likewise, the high and low values should not be added together.

1-2 Page 5, paragraph 10. The second sentence should state that the preliminary DEIS is also distributed to other Federal Agencies.

1-3 Page 6, resource estimate table. See comment for page ii.

1-4 Page 7, paragraphs 3 and 4. The discussion on mitigation via lease stipulation should be expanded to include coordination procedures for BLM-permitted pipeline applications.

1-5 Page 8, implementation of the Archeological Stipulation. The landward side of the "cultural resource sensitivity demarcation" contains hundreds of active and expired leases. It is estimated by USGS staff that more than 80 percent of these leases have been systematically surveyed utilizing geophysical techniques. It seems likely that a significant amount of data have been gathered that directly relate to relict geomorphology, the prime indicator of areas of high prehistoric-site potential. From Visual I it is apparent that most of the proposed lease tracts for Sales Nos. 67 and 69 are surrounded by active or expired leases. It is our recommendation that rather than continuing to require lessees/operators to conduct additional cultural resource surveys based solely on the location of their lease tract with respect to the demarcation line, the BLM, under the existing cooperative procedures, should examine and analyze the existing data to determine if there is a need for additional surveys. This would only require an analysis of the geophysical data available for adjacent lease tracts. We recommend that BLM examine the existing geophysical data for adjacent tracts and review the DEIS recommendations with a view towards reducing the number of additional cultural resource surveys that may be required.

1-6 Page 9, paragraph 2. Some of the tracts BLM intends to recommend for archeological survey have been identified through USGS geologic mapping as being located in areas having over 50 feet of recent sediments. These tracts, listed below, have a low probability for cultural resource identification and recoverability. We recommend that archeological survey lease stipulations not be included for these tracts.

Tract	Sediment Depth in Feet
67-4	50
67-5	50
67-22	50
67-23	75
67-24	75
69-9	150
69-10	125-150
69-73	67
69-24	50-75
69-27	75

1-7 Page 10, section 4. It is speculative to assume that "rocky outcrops" are all live bottom areas. Sentence four is inconsistent with the stipulation on page 24 (par. 2, second sentence) in its meaning (may vs. will) and coverage (drilling area vs. 1,820m radius of drilling site).

1-8 Page 21, figure I-7. This figure should show the 100m isobath and the 4-nautical-mile line.

1-9 Page 23, figure I-8. See comment for page 21.

1-10 Page 24, paragraph 7. The sentence on the geologic hazards program should read ". . . report on all tracts proposed for leasing that contain geologic hazards areas . . . ."

1-11 Page 24, last paragraph. The last line should read ". . . consists of requiring lessees to submit a Shallow Drilling Hazards Report and other site-specific geologic information as required in the Gulf of Mexico Notice to Lessees and Operators No. 75-8, Gulf of Mexico OCS Region Order No. 2, and CFR Part 250.34."

1-12 Page 26, paragraph 3. The typical geohazards stipulation should be replaced with the following:

> Portions of this tract may be subject to mass movement of sediments. Exploratory drilling operations, emplacement of structures (platforms) or seafloor wellheads for production or storage of oil or gas, and the emplacement of pipelines will not be allowed within the potentially unstable portions of this lease block unless or until the lessee has demonstrated to the DCM's satisfaction that mass movement of sediments is unlikely or that exploratory drilling operations, structures (platforms), casing, wellheads and pipelines can be safely

1-12 designed to protect the environment in case such mass movement occurs at the proposed location. This may necessitate that all exploration for and development of oil or gas be performed from locations outside of the area of unstable sediments, either within or outside of this lease block.

If exploratory drilling operations are allowed, site-specific surveys shall be conducted to determine the potential for unstable bottom conditions. If emplacement of structures (platforms) or seafloor wellheads for production or storage of oil or gas are allowed, all such unstable areas must be mapped. The DCM may also require soil testing before exploration and production operations are allowed.

1-13 Page 30, paragraph 2. The second and third sentences should be replaced with the following:

> Rules concerning regulation of air emissions from oil and gas operations on the OCS are found in 30 CFR 250.57 (45 FR 15128, March 7, 1980).

1-14 Page 40, last paragraph. The sixth sentence should read as follows:

> USGS Open-file Report 80-1312 (Hewitt, Knipmeyer, and Schluntz, 1980) estimates that there are about 2.88 billion barrels of oil and 38.0 trillion cubic feet of gas in unproduced reserves on leased Gulf of Mexico tracts.

1-15 Page 44, paragraph 1. Environmental Reports will not necessarily have to be submitted for exploration plans offshore Texas, as outlined in NTL 80-6. Also the Fish and Wildlife Service has chosen to undertake a selective review of exploration plans.

1-16 Page 44, paragraph 2. Categorical Exclusion Reviews (CER's) may be prepared instead of environmental assessments (EA's).

1-17 Page 44, paragraph 4. See comments for page 44, paragraph 1.

1-18 Page 44, paragraph 5. See comment for page 44, paragraph 2.

1-19 Page 44, paragraph 6. In addition to the Application for Permit to Drill (APD), the plan of development/production may contain applications for platforms, pipelines, and/or production equipment information. In cases where no new wells are to be drilled, the plan of development/production may not contain an APD. The second sentence in this paragraph is unnecessary and confusing and should be omitted. In the third sentence, the permit to install platforms is issued by USGS and should be included in the first sentence. The fourth sentence should be changed to read ". . .the 'application for permit to drill' must be reviewed for consistency with the Coastal Management Programs and concurred in by the affected States, either . . .."

1-20 Page 45, paragraph 3. This discussion should indicate that BLM prepares environmental analysis reports and USGS prepares EA's or CER's for pipelines that they permit. The last sentence should be changed to read:

> States review all Federal permit applications and actions related to pipelines and must find them consistent with their approved Coastal Management Program before Federal Agencies may issue such permits. This is often accomplished during the review of the plan of development/production.

1-21 Page 53, paragraph 6. USGS supplied separate mean estimates for Sales Nos. 67 and 69 addressing this alternative. These estimates are conditional and, as previously mentioned, conditional estimates are not additive. Therefore, the percentage of estimated resources for the combined sales, as addressed in this alternative, is not valid. It would be correct to address these estimates separately for each sale as in Alternative B-2.

1-22 Page 68, paragraph 4. Sediment discharge from the Mississippi River is estimated to be 684 million tons per year, not 303 million tons.

1-23 Page 102, table IV-1. Not only are the 95 percent and 5 percent probabilities not statistically additive, but neither are the conditional mean estimates statistically additive.

1-24 The high estimates for daily peak production of gas are reversed for Sales Nos. 67 and 69.

1-25 Because the offshore development estimates are derived from the conditional resource estimates, they are not statistically additive and cannot be combined for both sales.

1-26 Page 104, table IV-2. See comments for page ii regarding resource estimates and page 102, table IV-1, regarding development estimates.

1-27 USGS did not supply a breakdown of mean development estimates by area (i.e., Texas, Louisiana, Florida, and upper Gulf).

1-28 Page 106, table IV-4. See comments for page ii regarding resource estimates and page 102, table IV-1, regarding development estimates.

1-29 Page 124, paragraph 5. The possibility of dissipation of oil from spills reaching the beaches by relatively deep penetration into the beach sands is recognized. We suggest that the potential for resultant impacts on fresh ground water within the beach sands should be addressed and evaluated. Pertinent literature on this subject includes: Urish, D. W., 1981, Fresh water in a barrier beach: Maritimes, vol. 25, no. 1.

1-30 Page 128, paragraph 7. EPA standards are 48mg/l daily maximum oil and grease discharge and 72mg/l maximum monthly average oil and grease discharge. This paragraph does not appear to belong under the heading of "Temperatures."

1-31 Page 133, table IV-8. The source of the values in this table should be documented. It was not USGS.

1-32 Page 164, paragraph 1. With regard to resources, see the comment for page 11. Under no condition can the high or low values be added.

1-33 Page 166, last paragraph. See the comment for page 102, table IV-1, regarding development estimates.

1-34 Page 167, paragraph 1. See comments for page 40.

1-35 Page 203. Tract 67-197 is Charlotte Harbor NG 17-4 Block 842, not 841.

1-36 Visual No. 1. Tracts 67-224 and 67-225 are identified on the map as part of Sale No. 62 and they do not appear on the overlay.

Eddie R. Wyatt

1-1 Resource and development estimates for Sales 67 and 69 can be listed separately or can be combined in order to best support the needs of a particular discussion. We agree that adding these resource estimates and referring to them only as the low, mean, or high estimates for the two sales would be statistically incorrect. In most instances in the DEIS when the estimates for the two sales were added, this value was referred to as the "combined estimates" computed by BLM. Also, see our response to Comment 1-23 below.

1-2 This sentence has been deleted.

1-3 The resource estimate table has been changed to indicate the values for each sale separately. A separate rather than a combined listing is more appropriate to the discussion in this section.

1-4 Coordination procedures for BLM, as well as USGS-permitted pipelines, is discussed in Section I.E.7.c. Since pipeline permitting procedures are a post-sale activity, it would be inappropriate to discuss them in a section on mitigation via lease stipulations.

1-5 Prehistoric site potential cannot be adequately assessed on a tract-specific basis without a regional geologic framework as an interpretive base. Identifying the existence of relict geologic features, in itself, is not sufficient for establishing site probabilities, but questions as to their environment of formation, regional sequences of geologic events, and geologic processes which have modified them since their development must also be considered.

A study in the BLM FY 83 Regional Studies Plan is designed to redefine the prehistoric site probability zones by synthesizing existing regional geologic studies to form an interpretive framework. Such an approach, using a regional study, will also be more thorough, probably allowing for the deletion of more tracts from the archaeological survey requirement than the tract-specific approach would allow.

Until this study is completed, other alternatives which would serve to delete tracts from the archaeological survey requirement or reduce the survey requirements on some tracts are being proposed in connection with the Gulf of Mexico Regional EIS. Such alternatives, if adopted, may have an effect on archaeological survey recommendations for Sales 67 and 69. Any changes will, according to the usual procedure, be coordinated with all DM 655 agencies.

1-6 The ten tracts listed off south Texas may, indeed, have 50 feet or more of Recent age sediments; however, this fact does not preclude the existence of prehistoric cultural deposits within this recent sequence.

The question of prehistoric site probabilities is not as simple as you would indicate. Many factors, other than the absolute thickness of the recent sedimentary sequence, must be considered.

Erosional unconformities marking periods of low sea stand or short reversals during the Holocene transgression occur within the Holocene sequence throughout the Gulf of Mexico. These unconformities mark periods of subaerial exposure during which it would have been possible for prehistoric man to exploit the natural resources of the continental shelf. Even within deltaic sequences, features such as subaerially exposed natural levee ridges may occur as areas with a high probability for associated prehistoric sites.

An understanding of regional geologic processes and sequences of geologic events is necessary in order to determine the potential of any given area for containing intact prehistoric cultural deposits. In addition to this, it is necessary to determine, based on the depth below the mudline of all potential archaeological strata and the composition of overlying sediments, what methods of further investigation, if any, would be successful in any given area.

As indicated above, BLM is proposing a study for FY 83 which would systematically redefine the high probability areas for prehistoric site occurrence based on a synthesis of regionally geologic studies and and analysis of all pertinent variables.

Tracts were able to be deleted in the active Mississippi River delta as a result of the study entitled "Subaqueous Sediment Instabilities in the Offshore Mississippi River Delta" (BLM Open-File Report 80-01) due to the unique circumstances of an active delta. The 30+ feet of recent disturbed sediments across this area have never been subaerially exposed and, therefore, there is little probability for prehistoric site occurrence. Also, mass sediment movement has greatly reduced the possibility of recovering intact sites, either prehistoric or historic. This, combined with the extremely hazardous diving conditions and the ineffectiveness of most methods of subsurface investigations in an area of extremely underconsolidated sediments, led us to recommend deletion of these tracts from the archaeological survey requirement.

1-7 We do not assume all "rocky outcrops" are live bottom areas; that is why the stipulation requires photo-documentation of such areas. The "may vs. will" inconsistency has been corrected. The stipulation defines 1,820 m as the drilling areas referred to earlier.

1-8 The stipulations for the Flower Garden Banks, including Figure I-7, have been made consistent with the agreement at the May 5, 1981, DM 655 meeting that this stipulation should be based on the 85 m isobath and one and three miles from it.

1-9 Thank you for your comment. Please see our response to Comment 1-8.

1-10 This comment is acknowledged and the appropriate changes have been made.

1-11 This comment is acknowledged and the appropriate changes have been made.

1-12 The previous stipulation which BLM and USGS have agreed to under DM 655 is more appropriate than the newer versions. The previous stipulation presented in the DEIS in an example for all tracts in Sales 67 and 69 which might require the geohazards stipulation. The suggested newer version of the geohazards stipulation would be appropriate for certain tracts in proposed Sales 67 and 69; however, other tracts may contain shallow gas, faulting, unstable slopes, or other potentially geologically hazardous conditions which are not addressed by the wording in the new stipulation.

1-13 The suggested change has been made in the text.

1-14 The suggested change has been made in the text.

1-15 Thank you for your comment. The text has been changed to incorporate this information.

1-16 See our response to Comment 1-15.

1-17 See our response to Comment 1-15.

1-18 See our response to Comment 1-15.

1-19 See our response to Comment 1-15.

1-20 See our response to Comment 1-15.

1-21 We have changed the text by listing the relevant percentages for each sale. A separate rather than a combined listing is more appropriate to the discussion in this section.

1-22 Thank you for your comment. The suggested correction has been made in the text.

1-23 The combined estimates are the sum of the separate estimates and as such should not be viewed as representing statistically accurate probability estimates for the low (5%), mean, and high (95%) values computed for each sale or that could be computed for a single sale consisting of all the tracts included in the separate sales. The footnote has been revised to better reflect this fact.

1-24 This error has been corrected.

1-25 See our response to Comment 1-23.

1-26 USGS did provide a breakdown of oil and/or gas resources by area (Texas, Louisiana, Upper Gulf, and Florida Shelf). BLM allocated the offshore development by area based on the USGS breakdown of oil and/or gas resources.

1-27 Thank you for your comment. The text has been corrected.

1-28 Please see our responses to Comments 1-23 and 1-26.

1-29 The threat to the freshwater lens that exists in barrier island beaches caused by spilled oil percolating down through the porous sand appears to be a slight but conceivable problem that has been overlooked by researchers in favor of the more obvious and immediate effects to surface ecology.

Numerous communities exist along the Gulf of Mexico shoreline and barrier islands. Results of contact with different state agencies have shown that the inhabitants of the state of Florida, in particular, use barrier island water lens for individual domestic wells and small community water supplies. On Texas barrier islands the drinking water supply is collected in cisterns or transported in by truck. There are at present no known cases of oil contamination of these freshwater lens. The Ixtoc oil spill which heavily impacted Texas barrier islands has not, presently, shown an impact to groundwater supplies.

Although literature is available that shows groundwater contamination by water-soluble hydrocarbons of crude oil spilled on land, little literature is available dealing with marine oil spill impact to beach fresh groundwater.

When oil is beached, it is important to distinguish between the visual globules and the dispersed oil. The visual tar material is removed quickly by cleanup operations. It appears that the area of concern in regard to this impact is the dissolution of the dispersed fraction. Studies examining the fate of spilled oil on beaches conclude that natural processes of evaporation, dissolution, biodegradation, and beach erosion return the level of dispersed oil to background concentrations. However, a study by Guard and Cobet (1973) found that while dissolution is a minor process for removal of oil from an ocean slick or tar ball, it becomes important as oil is dispersed in beach sand. Whether the dissolved lower, molecular weight fractions will contaminate the freshwater lens or be dispersed by evaporation and biodegradation is unknown. The length of time for groundwater contamination to occur can be very long.

The potential for resultant impacts on fresh groundwater within beach sand resulting from the development of offshore petroleum reserves shall be addressed in the next environmental impact statement.

1-30 The EPA standards (DEIS, p. 128) have been corrected, but we note that USGS has the figures reversed in their comments.

1-31 The source of this information was BLM, 1980. This has been documented in the text.

1-32 Please see our responses to Comments 1-23 and 1-26.

1-33 Please see our response to Comment 1-23.

1-34 The suggested change has been made in the text.

1-35 The suggested correction has been made in the text.

1-36 These two tracts were not a part of Sales 67 and 69 when the overlay was being prepared and could, therefore, not be included on the visual.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR
FISH AND WILDLIFE SERVICE

MAY 14 1981

Memorandum

To: Director, Bureau of Land Management

From: Associate Director, Fish and Wildlife Service

Subject: Draft Environmental Impact Statement (DEIS) for OCS Lease Sales #67 and #69

We have reviewed the subject statement for the proposed Gulf of Mexico OCS Oil and Gas Lease Sales and our evaluation is that it appears to represent an adequate discussion of the proposals. We offer for your consideration in the Final Statement the following comments.

2-1 There are still data gaps concerning the location of "topographic highs" and "live bottoms" in some areas of the eastern Gulf of Mexico. Therefore, we recommend that all tracts off Alabama and Florida offered in the proposed sales be mapped for bathymetry and geologic hazards prior to the sales.

2-2 Most people using this document will read only those parts of interest to them. We suggest that DCM be included in the Abbreviations section. The document states that DCM refers to Deputy Conservation Manager on page 7, but if someone were interested only in biological stipulations and not familiar with the titles of officials, it could be confusing. The change would help to show that the DCM is a Geological Survey staff member.

2-3 We note that an area of significant topographical relief associated with Sebree Bank is located in Tract 69-6 (South Padre Island Area, Block 1070). We recommend that the FEIS consider this tract regarding the impact of operations on the bank.

2-4 In regard to the Flower Garden Banks, a stipulation on Page 10 requires shunting within 4 nmi. of the 100m isobath. However, other sections of the DEIS (e.g. Page 144), indicate shunting is required within 1-3 nmi. The FEIS should consistently state the stipulation requirements as described on Page 10.

2-5 Tract 67-13, Mustang Island Area, East Addition Block A 151 is within the 3-mile zone of Hospital Bank and Southern Bank; however, Figure I-1 does not clearly illustrate this fact. We recognize that the area within the 3 mile zone of Hospital Bank is under the same stipulation as Southern Bank (page 11).

2-6 The Pipeline Transportation Stipulation, pages 28 and 29, contains a statement in parenthesis as follows: "(To apply to all leases resulting from this lease sale)." Is it possible that this stipulation refers to the tracts located off the Florida Gulf Coast only?

2-7 The tenth paragraph on page 46 is difficult to understand. Either the verb tenses are incorrect or the last two sentences of this paragraph refer to results and conclusions instead of the total study.

2-8 Table IV-5 on page 108 contains two sets of data without a clear explanation. Consideration should be given to modifying this table so that it can be more easily understood.

2-9 The discussion of "Evaporation" on page 121 is unclear.

2-10 Page 223, fourth paragraph, discusses the effects of drilling fluids and cuttings, formation waters, and wastewater effluents on plankton. We agree with the conclusion that the adverse impact would most likely be short-term and that the plankton populations would resume their pre-spill levels; however, we disagree with the logic leading to this conclusion. The concept of degree of exposure because of winds and currents is not as significant a factor in the recovery of plankton to toxic spills as the fact that plankton seem to be ubiquitous and their populations drastically fluctuate under natural conditions. It is true that the plankton exposed to the toxic discharge would die; however, the plankton not exposed to the discharge would allow for recruitment and recovery of the plankton after the spill event.

2-11 The discussion of drilling fluids and cuttings, formation waters, and wastewater effluents on page 233 does not seem to fit. Note that the discussion concerns oil spills instead of drilling fluids.

We appreciate this opportunity to review the DEIS and hope our comments will be of assistance to you in preparation of the Final Environmental Impact Statement for these two OCS Lease Sales.

2-1 We agree that there are data gaps in our knowledge of live bottom areas in the eastern Gulf of Mexico. All tracts of the eastern Gulf of Mexico in 100 m water depth or less will have the live bottom stipulation of Section I.E.2.b. appended to it.

Additionally, the tracts in question off Florida and Alabama have been mapped for bathymetry and geological hazards by the Conservation Division, USGS. This survey was discussed on page 25 of the DEIS.

Additional surveys have been conducted off Louisiana, Mississippi, Alabama, and Florida which were funded through BLM's Environmental Studies Program.

Further survey work and characterizations will be required by lease stipulation prior to any activity on those tracts leased where "live bottoms" or geological hazards have been identified.

2-2 Thank you for your comment. The suggested change has been made.

2-3 The field level DM 655 group has never agreed that the biota on Sebree Bank warrants the protection afforded by the biological stipulation. BLM does not believe that leases in this area should be so stipulated. However, BLM is planning an in-house study of Sebree Bank in the summer of 1981, and if we determine that Sebree Bank should be so stipulated, we will make such a recommendation to the DM 655 group.

2-4 All references to the Flower Garden Banks stipulation have been made consistent with the agreement of the DM 655 group at its May 5, 1981 meeting.

2-5 Hospital Bank has been added to the description of the biological stipulation for tract 67-13.

2-6 The pipeline stipulation was included in the EIS for Sales 67 and 69 at the request of the office of Florida's OCS representative. The referenced stipulation was applicable to the tracts on the continental shelf and slope adjacent to the west coast of Florida for these proposed sales. Application to offshore areas of other states was neither made nor implied; therefore, the parenthetical insertion (to apply to all leases resulting from these lease sales) refers only to the tracts located off the Florida Gulf coast.

2-7 Additional studies to assess the impacts of the Ixtoc oil spill in the south Texas area have been initiated in FY 80. One of these studies addresses the effects of the oil on such socioeconomic aspects as commercial fisheries, recreation, and tourism. Another study investigates the extent and nature of oil from the Ixtoc blowout impinging on the south Texas OCS study area and its effects on benthic population and diversity.

2-8 Thank you for your comment. Table IV-5 has been corrected.

2-9 Telephone contact was made with DOI/FWS in order to clarify this statement. The discrepancy noted was between the 10-day and 3-day time factor applied to the major effect of evaporation on oil dissipation. The Oil Spill Model designates three days as being the time period for loss of the majority of the acutely toxic hydrocarbon components. This section of the EIS implies that a 10-day time factor is a realistic estimate for loss of most hydrocarbons containing less than Carbon (boiling point less than 250°C). Since the Academy of Sciences (1975), in their significant summary of worldwide oil spill experts, cites this time, it was used to describe evaporation effects on oil. However, when one considers the variables affecting evaporation rate, both designations become arbitrary. Evaporation is a function of temperature, windspeed, atmospheric conditions, solar radiation, ground or sea conditions (i.e., roughness), the dimensions of the oil spill, and the volatility and diffusion characteristics of the spilled oil. Furthermore, the definition of the acutely toxic components is unclear. Nonetheless, the inconsistency in the text shall be cleared up in the next EIS, and two days will stand as the evaporation factor time period of significance.

2-10 We have modified the statement in the Summary Impact Assessment (Appendix B, page 223 of the DEIS) regarding effects on plankton to reflect FWS comments.

2-11 The words "oil spills" on page 233 (DEIS) are a misprint which has been corrected.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
[illegible]
[illegible]

MAY 7 1981

Memorandum

To : Manager, New Orleans Outer Continental Shelf Office, BLM
New Orleans, Louisiana

From : Assistant Regional Director--Environment, FWS, Atlanta, Georgia

Subject: Draft Environmental Impact Statement for OCS Lease Sales 67 and 69

We have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Gulf of Mexico OCS Oil and Gas Lease Sales 67 and 69 and our evaluation of the document and accompanying visuals is that they are adequate, except for the following.

3-1 There are still data gaps concerning the location of "topographic highs" and "live bottoms" in some areas of the eastern Gulf of Mexico. Therefore, the Fish and Wildlife Service recommends that all tracts off Alabama and Florida offered in the proposed sales be mapped for bathymetry and geological hazards prior to the sales.

3-2 Because most people using this document will read only parts of interest to them, we suggest that DCM be included in the Abbreviations section. The document states that DCM refers to Deputy Conservation Manager on page 7, but if someone were interested in biological stipulations only and was not familisr with the titles of people, he could be confused. It might also help to show that the DCM is a Geological Survey staff member.

3-3 The Pipeline Transportation Stipulation, pages 28 and 29, contains a statement in parenthesis as follows: (To apply to all leases resulting from this lease sale). Is it possible that this stipulation refers to the tracts located off the Florida Gulf Coast only?

3-4 The tenth paragraph on page 46 is difficult to understand. Either the verb tenses are incorrect or the last two sentences of this paragraph refer to results and conclusions instead of the total study.

3-5 Table IV-5 on page 108 contains two sets of data without any explanation. After careful study it can be discerned that the upper set shows number of spills and the lower set shows the estimated volumes in barrels. Consideration should be given to modifying this table so that it can be more easily understood.

3-6 The discussion of "Evaporation" on page 121 is unclear.

3-7 Page 223, fourth paragraph, discusses the effects of drilling fluids and cuttings, formation waters, and wastewater effluents on plankton. This paragraph should be modified. Plankton do not move with the wind as stated, but they seem to be ubiquitous and their density fluctuates drastically under natural conditions. Therefore, if discharges did kill portions of the populations in a local area, the effects would be short-lived and unmeasurable within a short period of time.

3-8 The discussion of drilling fluids and cuttings, formation waters, and wastewater effluents on page 233 does not seem to fit. Note that the discussion concerns oil spills instead of drilling fluids.

Thank you for the opportunity to review the Draft Environmental Impact Statement for proposed OCS oil and gas lease sales 67 and 69.

3-1 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-1.

3-2 Thank you for your comment. The suggested change has been made.

3-3 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-6.

3-4 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-7.

3-5 Thank you for your comment. Table IV-5 has been corrected.

3-6 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-9.

3-7 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-10.

3-8 Thank you for your comment. Please see our response to FWS Washington Office's Comment 2-11.

United States Department of the Interior

NATIONAL PARK SERVICE
SOUTHEAST REGIONAL OFFICE
75 Spring Street, S.W.
Atlanta, Georgia 30303

IN REPLY REFER TO:
L7619 SER-OS

APR 23 1981

Mr. John L. Rankin, Manager
New Orleans Outer Continental Shelf Office
Bureau of Land Management
Hale Boggs Building
500 Camp Street, Suite 841
New Orleans, Louisiana 70130

Dear Mr. Rankin:

Thank you for the opportunity to review the Draft Environmental Impact Statement for Proposed Oil and Gas Sales 67 and 69.

The National Park Service favors Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts). This deletion would eliminate major impacts and potential impacts on the three islands of Gulf Islands National Seashore as well as other barrier islands that also have important environmental and recreational qualities.

This deletion would eliminate only four percent of the proposed tracts in this sale, but it would protect an environmentally sensitive barrier island system from visual and noise impacts associated with operational activities as well as protect them against the potential impacts of oil spills.

4-1 To our knowledge the area encompassed by these 21 tracts has never been offered for lease before, nor have other tracts been leased or offered in such close proximity to the islands and waters of Gulf Islands National Seashore. We believe that in this case the environmental and recreational values of these sensitive barrier islands outweigh any short-term benefits that oil exploration and production would provide.

Gulf Islands National Seashore in Mississippi consists of Ship Island, Horn Island, Petit Bois Island, and a mainland site at Davis Bayou near Ocean Springs. Daily access by ferry is provided to Ship Island which has concentrated beach use and a restored fort (Fort Massachusetts) that is a major interpetive feature. Horn Island and Petis Bois Island total about 20 miles in length and were included by Congress in the National Wilderness System. The National Seashore boundaries extend one mile offshore to protect the surrounding integral environment.

4-2 Two of our objections to exploration and production activities near the national seashore are the noise and visual intrusions that they introduce to the recreationist seeking the quiet and solitude that are not available on the majority of shorelines of this nation. Our greatest fear, however, is that of moderate to major oil spill. Even though oil spills are played down in the document, they do occur with astounding regularity (page 108). They are recognized as the most common cause of environmental pollution associated with offshore oil and gas activity (page 107). You have also recognized that the closer these operations are to the shoreline--the greater the risk of environmental damage.

4-3 Other factors that increase the environmental risk of oil spill are the relative low energy beaches, the high storm damage potential, and the fact that fully half of the 21 tracts fall within established shipping fairways and anchorage areas. These factors are not considered in the Oil Spill Risk Analysis; therefore, we do not consider it a valid estimate of environmental damage potential in this case.

4-4 In summary, we support Alternative B-3 (Deletion of Mississippi/Alabama Nearshore Tracts) to protect Gulf Islands National Seashore and adjacent barrier islands from potential environmental damage from oil spills and the visual and noise impacts associated with exploration and production operations.

Sincerely yours,

Neal G Guse

Acting Regional Director
Southeast Region

4-1 Prior to the preliminary planning for lease Sales 67 and 69, there had been little industry interest in investing in the first tier of OCS tracts seaward of the Gulf Islands National Seashore and Wilderness Area. Recent natural gas discoveries in the area have focused exploration interest in the Mississippi/Alabama nearshore area. As was indicated in the recent Alabama lease sale held subsequent to the issuance of the DEIS for Sales 67 and 69, additional petroleum exploration and development in the vicinity of the Mississippi/Alabama outer islands is likely to be expanded irrespective of the Secretary's final decision on these 21 tracts.

4-2 We have added in the FEIS an additional paragraph to our impact discussion in Section II.B.3.b. (page 58 in the DEIS) which would indicate that a major oil spill would likely cause a serious seasonal (short-term) impact should it directly hit Gulf Islands National Seashore. Should all the 472 proposed lease tracts be sold and developed, there is only a 2% probability that a major spill would affect the Mississippi portion of the Gulf Islands National Seashore. Because the tracts near the Seashore are gas prone, we thought it inappropriate to stress and describe the very low probability of a major oil spill. Even though oil spills do occur with some regularity on the OCS, as was indicated in Table IV-5 on page 108 of the DEIS, only two spills of over 1,000 barrels resulting from OCS activity nationwide have occurred since 1970. It is only these very large spills that are likely to cause serious short-term impacts to shoreline recreational areas. We do not deny that OCS leasing in the nearshore areas around the Mississippi/Alabama islands will cause some adversity to seashore amenities and pose some minimal threat to serious impact (short-term), but we have attempted to make an objective and realistic assessment of the environmental consequences and relative threats posed by these 21 tracts. It should be noted also that these tracts are identified as an option for deletion from the sale if the Secretary should choose to do so.

4-3 On page 56 of the DEIS we noted that oil and gas structures are not allowed in established navigation fairways. Industry is aware of this prohibition and should they successfully lease fairway tracts, they will be required to explore for and develop commercial resources from outside the fairways. Exploration and development can be permitted in anchorage areas; however, extraordinary safety precautions are required should there be no other feasible way to exploit the petroleum resources. Shipping fairways or tankering routes and oil transmission pipelines are all factored into the base data for selecting launch points in the Oil Spill Risk Analysis (Appendix D of the DEIS).

4-4 Thank you for your comment.

OFFICE OF THE DIRECTOR

United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

May 4, 1981

Memorandum

To: Director, Bureau of Land Management (542)

Deputy
Through: Assistant Secretary--Energy and Minerals

MAY 7 1981

From: Director, Bureau of Mines

Subject: Draft environmental statement for proposed Outer Continental Shelf Oil and Gas Lease Sales Nos. 67 and 69

5-1 Minerals other than oil and gas known to occur on the outer continental shelf include sulfur, salt, and oyster shell. This draft mentions only the oil and gas. We believe, however, that all minerals occurring in the proposed lease areas should be cited in the draft and the impacts of hydrocarbon exploration and production upon them should be discussed.

Thank you for the opportunity to comment.

DEPUTY Director

5-1 Sulfur is the only nonfuel mineral which has been mined on the OCS in the Gulf of Mexico. The last sulfur lease sale was held on May 13, 1969, and resulted is only four leases being issued out of 138 offerings. No commercial dredging has been done on the OCS in regards to shell dredging. At one time the Corps of Engineers let a permit to determine the potential for dredging activities, but the tests were inconclusive. No interest has been shown in these mining activities.

Recent studies in the eastern Gulf of Mexico reveal the potential for phosphate occurrence in marine sediments; however, it is far too premature to consider a mechanism for leasing this resource. Therefore, hydrocarbon exploration and development resulting from this proposed action should have no impact on nonfuel minerals on the OCS.

United States Department of the Interior
HERITAGE CONSERVATION AND RECREATION SERVICE
WASHINGTON, D.C. 20240

IN REPLY REFER TO: W750
ER-81/14

Memorandum

To: Director, Bureau of Land Management

From: Acting Director, Heritage Conservation and Recreation Service

Subject: Draft Environmental Statement for Proposed Outer Continental Shelf Oil and Gas Lease Sales Nos. 67 and 69

6-1 We have reviewed the subject document as requested in your March 20, 1981, memorandum and find it to be adequate in the areas of our program interests.

Robert A. Ritsch

6-1 **Thank you for your comment.**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D C 20460

MAY 20 1981

OFFICE OF
THE ADMINISTRATOR

Mr. Ed Hastey
Acting Director
Bureau of Land Management
U.S. Department of the Interior
Washington, D.C. 20314

Dear Mr. Hastey:

The Environmental Protection Agency (EPA) in accordance with its authorities under the National Environmental Policy Act and Section 309 of the Clean Air Act has reviewed the Draft Environmental Impact Statement (DEIS) for the Proposed 1981 Gulf of Mexico Outer Continental Shelf (OCS) Oil and Gas Lease Sale Nos. 67 and 69. Our comments on the DEIS relate to some corrections and clarifications regarding biological stipulations for these sales and the oil spill risk analysis.

7-1 The DEIS information on EPA's regulatory responsibilities under the Clean Water Act does not reflect the current status. We have enclosed a revised description of EPA's responsibilities for your use. Also, we believe that the maps presented in Figures I-1 thru I-8 contain errors in the one and three mile boundary lines. In some of these diagrams, either the one mile or the three mile boundary is not drawn to scale.

7-2 We note that historical data relating to existing technology is used in the risk projection analysis. However, the proposed sale will require use of technology (subsea completion and production systems) whose risk may be different than the historical average. To the extent that information is available that allows these risks to be differentiated, you should do so. This risk analysis work would also be useful in evaluating similar operations in the future.

7-3 Finally, it is not clear how the conclusions for the mitigative stipulations presented in the DEIS follow from data presented. We suggest that the Final EIS include the rationales for the protective biological stipulations. Without the rationales, it is difficult to evaluate the effectiveness of these measures in protecting the more sensitive and valuable biological resources

7-3 from operational threats. EPA has developed information as part of its permitting process that deals with these issues. We would be glad to meet with you to describe this information, and to discuss coordinating your stipulations with our permitting requirements.

Thank you for this opportunity to comment on this draft EIS for the Gulf of Mexico proposed Sales 67 and 69. Please feel free to contact me if you have any questions.

Sincerely yours,

William N. Hedeman, Jr.
Director
Office of Federal Activities

Enclosure

The material on page 29 under a.) Regulation of Discharges, Effluents, and Emissions should be corrected and updated as follows:

a. Regulation of Discharges, Effluents, and Emissions

(1) The Clean Water Act

The Environmental Protection Agency (EPA) regulates effluent discharges such as drilling fluids, drill cuttings, and produced waters associated with offshore oil and gas exploration and production pursuant to the Clean Water Act's National Pollutant Discharge Elimination System (NPDES) permit program. Section 301 of the Clean Water Act prohibits the discharge of any pollutant without a NPDES permit, or in violation of the terms and conditions of a NPDES permit. Section 301 also requires dischargers to meet certain technology-based effluent requirements. For the offshore operations these effluents limits are contained in 40 CFR 435, Subpart A, Oil and Gas Extraction Point Source Category.

Section 403 of the Clean Water Act further requires that an NPDES permit for discharges into marine waters be issued in compliance with EPA's guidelines for determining the potential degradation of marine waters. The final 403(c) Ocean Discharge Criteria guidelines (45 FR 65952) set forth specific criteria for determinations of unreasonable degradation and irreparable harm which must be made prior to the issuance of any NPDES permit for discharges into marine waters.

NPDES permits for offshore oil and gas operations in the federal waters of the Gulf of Mexico are issued by EPA. Individual NPDES permits may be issued to point sources or permits may be issued to categories of point sources discharging similar types of wastes under EPA's general permit program. Three general NPDES permits for facilities operating in the Gulf of Mexico were issued by EPA on April 3, 1981. (46 FR 20284). Certain lease blocks or lease areas containing potentially productive or unique biological communities are specifically excluded from coverage by the general permits. They may be covered by subsequent general permits.

7-1 We thank EPA for the information regarding their responsibilities under the Clean Air Act. We have incorporated this information in the FEIS. Figures I-1 through I-8, which show the areas of the central and western Gulf of Mexico in which the biological stipulations apply, are drawn to scale but are not necessarily all the same scale due to the demands of printing. The printer may need to reduce some figures more than others. However, in all cases the figures are drawn correctly, and the scale may be deduced from the distance shown on the arrows from the center of the banks to the circles.

7-2 The projection rates of oil spillage applied to the oil spill risk analysis are invariably controversial. It can be proven that the most widely accepted criteria used to determine factors affecting oil spillage is historical data collected from the OCS area, and when availability of information permits, collected from the particular region of interest; however, to improve our understanding of oil spill probability projections, BLM has awarded a contract to The Futures Group of Glastonbury, Connecticut (Contract AA851-CT0-69). The study involves the assembly and editing of all data bases on OCS-related oil spills worldwide and the development of a model for postulating spill-related probability distribution densities. The contractor will then determine the most appropriate factor (termed by The Futures Group, exposure variable) for estimating the probabilities for OCS spill occurrence and volume.

A memo is being prepared and will be transmitted to the COAR on said project which requests that The Futures Group include in their analysis data on the risk associated with subsea completion systems. It is noted that, as of date, there has been only one minor accident associated with subsea production in the Gulf of Mexico OCS region. The accident involved a gas leak with minimal pollution. A light sheen of less than 50 barrels was reported; therefore, the known risk of spillage is essentially zero. To apply this rate to deepwater areas where this technology may be used would probably be criticized for assuming a minimal probability.

7-3 The rationale for the use of the biological stipulations is most fully described in Section IV.C.2.a. (pages 125-127 of the DEIS), but it is also mentioned in Sections I.C.2.b. (pages 9-11 of the DEIS), II.A.2. (page 51 of the DEIS), II.B.1. (pages 53 and 54 of the DEIS), and IV.D.1. (pages 143-150 of the DEIS). DM 655 meetings and scoping meetings are existing mechanisms for discussing and coordinating stipulations.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON 20426

IN REPLY REFER TO:

MAY 14 1981

MAY 11 1981

Manager
New Orleans, OCS Office
Bureau of Land Management
Hale Boggs Federal Building, Suite 841
500 Camp Street
New Orleans, Louisiana 70130

Dear Sir:

We appreciate the opportunity to comment on the draft environmental impact statement (DEIS) evaluating the proposed Gulf of Mexico Outer Continental Shelf (OCS) Oil and Gas Lease Sales 67 and 69. The Office of Pipeline and Producer Regulation (OPPR) of the Federal Energy Regulatory Commission (FERC) offers the following comments.

8-1 (1) The discussion of "Pipelines: Rights-of-Way and Rights-of-Use and Easement" on page 45 should include the FERC as the agency which reviews applications for interstate natural gas pipelines across the OCS. This information, accurately presented on page 40 of the DEIS, should also be included in the final statement in the discussion on page 45.

8-2 (2) The description of onshore facilities beginning on page 134 of the DEIS indicates that these two lease sales would maximize the use of existing pipeline transportation networks and onshore infrastructure in the central and western gulf lease areas. However, OCS activities in the Florida Shelf area of the eastern gulf could require new onshore/offshore OCS-related facilities. The DEIS states that new pipeline landfalls in the eastern gulf region could be located in Manatee, Hillsborough, and Lee Counties. Existing onshore natural gas pipelines in Hillsborough and Manatee Counties are owned by Florida Gas Transmission Company, an interstate natural gas company under FERC jurisdiction. These are small-diameter pipelines which receive gas from the company's mainline system, generally located within central and eastern Florida.

8-3 The Commission staff recognizes the national importance of OCS exploration and development, as well as the need for effective environmental safeguards. Based upon a review of your DEIS, we believe that the proposed OCS oil and gas lease sale is in the national interest.

Very truly yours,

Eugene C Gamboa for
Kenneth A. Williams, Director
Office of Pipeline and Producer
Regulation

8-1 The suggested correction has been made in the text.

8-2 Thank you for your comment.

8-3 Thank you for your comment.

MARINE MAMMAL COMMISSION
1625 EYE STREET, N. W.
WASHINGTON, DC 20006

NEW ORLEANS OCS
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14 May 1981

Mr. John L. Rankin
New Orleans OCS Office
P.O. Box Federal Building,
Suite 841
500 Camp Street
New Orleans, Louisiana 70130

Dear Mr. Rankin:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed and offers the following comments on the "Draft Environmental Impact Statement, Proposed OCS Oil and Gas Sales 67 and 69".

Twenty-seven different species of marine mammals have been reported to occur in, or migrate through, the Gulf of Mexico. Of these, the bottlenose (Tursiops truncatus) is the most common, particularly in inshore areas, and seven species - the West Indian manatee (Trichechus manatus), the sperm whale (Physeter catodon), the right whale (Eubalaena glacialis), the humpback whale (Megaptera novaeangliae), the sei whale (Balaenoptera borealis), the fin whale (Balaenoptera physalus), and the blue whale (Balaenoptera musculus) - are designated as "endangered" under the Endangered Species Act.

The DEIS indicates (Appendix E) that the Bureau has consulted with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, pursuant to Section 7 of the Endangered Species Act, and determined that activities and events associated with the proposed action are not likely to jeopardize the aforementioned species of endangered whales or the West Indian manatee provided that: (a) Tampa/Port Manatee is used as the support base for exploration and possible development of oil and gas resources on the West Florida Shelf; and (b) the Bureau re-institutes "Section 7" consultations if new information on possible adverse impacts becomes available or if the proposed action is modified.

The Commission concurs with the aforementioned determination, but is concerned that activities and possible oil spills associated with offshore oil and gas development in the Gulf of Mexico could have significant adverse effects on non-endangered marine mammals, particularly local populations of bottlenose dolphins. Because of this concern, the Commission's 7 November 1980 response to your request for information concerning the possible effects of OCS Lease Sales 72 and 74 recommended that the Bureau consult with the National Marine Fisheries Service to identify such additional information, lease stipulations, monitoring programs, or other measures that might be needed to assure that local populations of bottlenose dolphins and other non-endangered marine mammals will not be affected adversely by oil and gas development in the Gulf of Mexico. The November 1980 letter also noted that both the National Marine Fisheries Service and the U.S. Fish and Wildlife Service were conducting or supporting research programs that might contribute to assessing and monitoring the possible adverse effects of offshore oil and gas development on marine mammal populations in the Gulf of Mexico, and recommended that the Bureau consult with these agencies to determine whether and how related research programs being conducted or supported by the Bureau, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service might be coordinated and integrated to meet data needs more effectively and at less cost.

Although the DEIS indicates (pp. 218-220) that activities and events that would or could be associated with the proposed lease sales are not likely to have an adverse effect on any species of marine mammal, including the bottlenose dolphin, it does not provide the rationale for the determination that non-endangered species and populations will not be affected adversely nor does it indicate whether the determination is based upon consultations with the National Marine Fisheries Service. Additionally, we have not yet received a response to the recommendations made in our letter of 7 November 1980, and are uncertain as to whether you have consulted with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to determine how related research programs being conducted or supported by these agencies and your office might be coordinated and integrated to meet data needs more effectively and at less cost. We would be grateful, therefore, if you would advise us as to the basis for the determination that the proposed action is not likely to have
9-1 an adverse effect on local populations of bottlenose dolphins or other non-endangered marine mammals and what steps have been, or are being, taken to coordinate and, as appropriate, integrate on-going and planned marine mammal salvage, survey, and population studies in the Gulf of Mexico.

If you have any questions concerning this or our earlier letters concerning offshore oil and gas development in the Gulf of Mexico, I would be pleased to discuss them with you.

Sincerely,

John R. Twiss, Jr.
Executive Director

9-1 The basis for the determination that the proposed action is not likely to have an adverse effect on local populations of bottlenose dolphins or other nonendangered marine mammals is based on the following factors: (1) there is a 27-year history of OCS oil/gas activities in the Gulf of Mexico without apparent adverse effects on marine mammals in this region; (2) the oil spill risk analysis prepared for the proposed action indicates an expected 0.37 oil spills to result; (3) ongoing surveys (research) indicate bottlenose dolphins can recognize oil slicks on the surface of water and will (or could) avoid these oil slicks; and (4) after ongoing marine mammals surveys and effects studies are completed, a more definitive determination of the potential effects of oil/gas activities may be possible.

Currently ongoing and proposed marine mammal research/surveys sponsored/performed by BLM, FWS, and NMFS in the southeastern U.S. (Gulf of Mexico) are coordinated at the field level as time and travel funds permit. There is a desire to integrate the data base from these ongoing studies when these studies are completed.

DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60267
NEW ORLEANS, LOUISIANA 70160

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LMNPD-RE 13 May 1981

SUBJECT: DEIS, BLM, Proposed OCS Oil and Gas Sales, Nos. 67 & 69,
Gulf of Mexico

Division Engineer, South Atlantic
ATTN: SADPD-R

1. Reference letter, DAEN-CWP-V, 3 April 1981, subject as above (Incl 1).

2. This district has reviewed the subject DEIS and the following comments are offered:

10-1 a. On page 10 and ensuing pages, plans for monitoring effects are mentioned. It should be stated that this monitoring would include regular analysis of water quality parameters. In order to evaluate water quality monitoring plans, other information should also be provided: names of specific pollutants being monitored; frequency of monitoring process; how and to whom results are reported; the criteria regarded as necessary for preventative action; and actions considered viable in light of deteriorating water quality conditions.

10-2 b. In Section F (p. 45), Environmental Studies, the extent of baseline water quality studies is not mentioned. Much more information is necessary before the adequacy of these environmental studies could be assessed from a water quality viewpoint. What kinds of studies were done? Where? What data regarding water quality background levels were collected? What conclusions or predictions were made?

10-3 c. On page 114, a discussion of spills indicates that accidents involving barges and tankers are the largest contributor to petroleum pollution - yet little information is available for projections in Louisiana waters. The next page and Appendix D contain projections in very specific terms. This seems contradictory.

10-4 d. Table IV-6 beginning on page 116 and continuing on page 118 is misleading because of this unusual split presentation. The table should appear all on one page.

LMNPD-RE 13 May 1981
SUBJECT: DEIS, BLM, Proposed OCS Oil and Gas Sales, Nos. 67 & 69,
Gulf of Mexico

10-5 e. The best water quality discussion appears on pages 122-129; however, there is still no description of baseline studies or proposed monitoring activities.

FOR THE DISTRICT ENGINEER:

1 Incl
as

R. H. Schroeder Jr.
for JAMES F. ROY
Chief, Planning Division

CF: w/o incl
LMVPD-R

10-1 Discharges of effluents which might affect water quality are discussed in the EIS in Section IV.C.2.d., which concerns disposal of wastewater contaminants and solid wastes. As noted in that discussion, all effluents from offshore structures are regulated by EPA via their NPDES permits. For nonsensitive marine areas in specified areas of the Gulf of Mexico, a general NPDES permit has been issued; for selected sensitive areas, individual permits will be required. Effluents which might impact onshore water quality are discussed in Appendix B, Item B.2. of the DEIS (pages 238-239), where it is noted that effluents will be regulated by the state water quality boards in compliance with EPA guidelines. Formal evaluation of water quality monitoring plans will occur as more specific actions, including applications for permits to explore or develop at offshore sites and various types of permits for onshore construction or other activities, are processed.

10-2 The BLM OCS Environmental Studies Program has included two major baseline studies in the Gulf of Mexico: one off south Texas (roughly between Matagorda Bay and the Rio Grande, from nearshore to approximately the edge of the shelf) and one off the coast of Mississippi, Alabama, and Florida, (roughly between Mobile Bay and Charlotte Harbor, Florida). Water column parameters studied included salinities, temperatures, dissolved oxygen, nutrients (nitrate, phosphate, and silicate), suspended solids, dissolved trace metals and hydrocarbons, and trace metals and hydrocarbons associated with particulate matter. In general, the results indicated that the seawater samples analyzed were normal neritic or oceanic waters, uncontaminated except for occasional hydrocarbon contamination, apparently due to transport of petroleum through the areas, natural seeps, minor contamination from routine ship operations, or sample contamination. The results of all these studies are available through the National Technical Information Service. Please contact us if you desire more specific ordering information. No BLM-funded environmental studies have assessed nearshore or onshore water quality, except for the nearshore stations of the above-referenced baseline studies.

10-3 Spill rates based on spills of 1,000 barrels or greater are given in the introductory paragraph of Section IV.C.1.c.(2). The rate for pipelines and platforms are based on USGS historic files of OCS Gulf of Mexico accidents. They have been updated to 1979 but show no significant change. The tanker spill rate is based on worldwide information, and the rate is divided in half to make some estimate of OCS tanker accident rates. The assumption applied is that tankers spent 50% of their travel in OCS waters. The statement made in Section IV.C.1.a.(6). that tanker spill rates are higher is incorrect and has been deleted. It is the volume of oil handled by tankers that determines them as the most hazardous source of oil spillage. There is a study currently being funded by BLM that is examining oil spill risk in relation to transportation modes, destinations, and routes (Contract AA851-CT0-69 with The Futures Group) that may be applicable to understanding oil spill probabilities in Louisiana waters. It is unclear what the commentator means when he says projections in Louisiana waters is addressed on the following page and Appendix D (the oil spill model). Although the oil spill model does determine oil spillage landfall locations in Louisiana, the rates of oil spillage and trajectories are determined only for OCS waters.

10-4 Thank you for your comment. The suggested change has been made in the text.

10-5 Please see our responses to Comments 10-1 and 10-2 above.

DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
510 TITLE BUILDING, 30 PRYOR STREET, S.W.
ATLANTA, GEORGIA 30303

REPLY TO
ATTENTION OF: SADPD-R

12 June 1981

Manager, New Orleans OCS Office
Bureau of Land Management
U.S. Department of Interior
Hale Boggs Federal Building
New Orleans, Louisiana 70130

Dear Sir:

The attached comments on the DEIS for the Proposed OCS Oil and Gas Sales, Nos. 67/69, Gulf of Mexico, are provided as discussed previously with your office by Dr. M. A. Cooper of this office.

We appreciate the opportunity to review the DEIS. If you have any questions on the comments, please contact Dr. M. A. Cooper, FTS 242-4619 or Mr. James Hildreth, Chief, Environmental Quality Section, Mobile District, FTS 537-2724.

Sincerely,

1 Incl
Comments

DAN M. MAULDIN
Acting Chief, Planning Division

Comments - DEIS, BLM, Proposed OCS Oil and Gas Sales

11-1 1. General - In 1977 the Federal Legislature authorized the US Army Corps of Engineers to conduct a study to determine whether present and proposed dredging activities in the Gulf Coast area could be modified to increase economic efficiency and promote environmental quality. It is known as the Mississippi Sound and adjacent areas study and encompasses portions of Alabama and Mississippi from Lake Borgne on the west to the eastern shore of Mobile Bay and seaward in the Gulf of Mexico to the 120-foot depth contour. As part of this study, thirteen areas in the Gulf of Mexico were examined as potential sites for offshore disposal of dredged material. Of these thirteen, six sites (attached map) have been selected for intensive physical, chemical, and biological studies. The purpose of these studies is for possible formal designation of the areas as dredged material disposal sites in accordance with the 11 January 1977 Ocean Dumping Criteria developed by the Environmental Protection Agency (EPA) pursuant to the Marine Protection, Research, and Sanctuaries Act of 1972, PL 92-534. In particular, the EPA has issued a statement of concurrence on tentative selection of two of these sites, numbered 5 and 6, for disposal of new work and maintenance dredged material from Mobile Harbor. As such, it is requested that stipulations be provided in OCS lease sales to avoid conflicting uses of the above discussed areas.

11-2 2. Page 124 - The environmental impacts of gas blowouts are stated to be neglibile. As noted on page 58, the 21 Mississippi/Alabama nearshore tracts are gas prone with no commercial oil resource likely to be encountered. This has been the case with recent exploration in lower Mobile Bay where significant amounts of natural gas have been found and no commercial quantities of oil have been encountered. However, these gas deposits contain high concentrations of hydrogen sulfide (H_2S). It is possible that OCS wells will also have similar concentrations of the toxic gas. Therefore, the possible impacts associated with release of this gas during exploration, production drilling, and transport should be discussed in detail, in particular, if gas pipelines are routed through populated areas.

1 Incl
as

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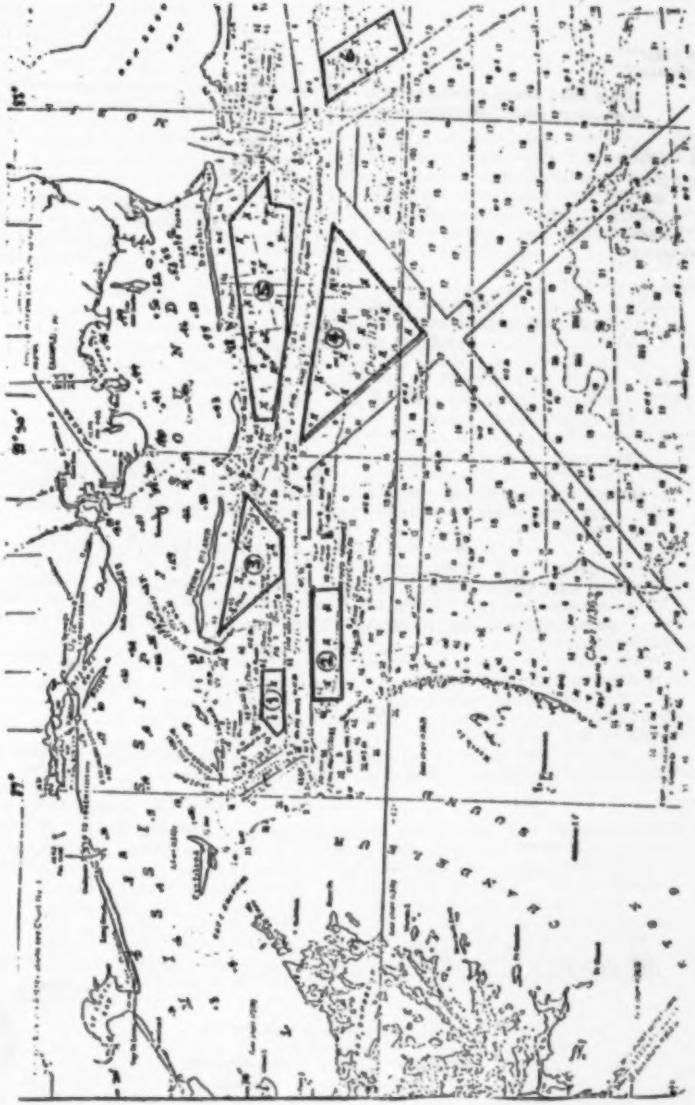

Figure 1

11-1 Thank you for your comment. We do not believe that stipulations are needed to avoid conflicting uses of areas designated as ocean disposal sites for dredge spoil due to the Corps of Engineers permitting authority for oil and gas structure placement. It will be several years before any oil and/or gas related drilling activities will commence in these areas. We do not know the details of your studies to be conducted on the OCS, but we now expect that these studies would be concluded before oil and/or gas exploration would begin on any of the 21 Alabama/Mississippi nearshore tracts. However, to avoid possible future conflicts with subsequent Department of Interior Gulf-wide oil and gas lease sales and Corps of Engineers/EPA ocean dumping studies, we suggest that the New Orleans OCS Office of BLM be advised of both ongoing and planned studies by the Corps/EPA on the OCS in the Gulf of Mexico.

11-2 As stated on page 58 of the DEIS for Sales 67 and 69, the 21 Mississippi/Alabama nearshore tracts are believed to be gas prone. This is not to say that oil is not present in recoverable quantities, but rather to say it is more likely to contain gas. We are aware of the recent activity at the mouth of Mobile Bay where significant amounts of gas have been found with hydrogen sulfide (H_2S) concentrations on the order of 8%-9.5%. Although we cannot directly infer this trend to continue in the 21 nearshore tracts off Mississippi/Alabama, it is possible that these conditions exists.

If exploration were begun in this area, it is certain that OCS Order No. 2, paragraph 8, would be applicable. Whereby, where drilling operations are planned which will penetrate reservoirs known or expected to contain H_2S or in the areas where the presence of H_2S is unknown, or upon encountering H_2S, the preventive measure and operating practices set forth in the USGS "Outer Continental Shelf Standard Safety Requirements for Drilling Operations in a Hydrogen Sulfide Environment" No. 1 (GSS-OCS 1), shall be followed.

Many precautions are taken on each and every step of the project when H_2S is believed to be present, such as special metalurgical considerations are affected regarding the casing, corrosion inhibitors are added to muds, special welding practices are followed, etc. Industry is not new to dealing with H_2S. There is a significant amount of experience in dealing with these special problems, and technology has advanced far enough to safeguard against these problems with a high degree of confidence. Onshore, sour gas is routinely produced and has been shown to be of economic benefit.

The most noticeable impact of these activities would be in venting or flaring this gas; however, we must consider that onshore air quality is strictly controlled. Furthermore, 30 CFR Part 250 provides the necessary regulations for control of offshore emissions.

The processing of sour gas would most likely take place onshore since this process would be that much more expensive offshore. Processing plants have shown that it is well within the limit of existing technology to remove 98% of all sulfur by use of the CLAUS technique (See Hydrocarbon Processing, April 1981, page 129; and Oil and Gas Journal, March 17, 1980, page 155). Furthermore, it is possible to remove up to 99% if tailgas cleanup is used.

DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553

REPLY TO
ATTENTION OF

SWGED-E

14 MAY 1981

Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
Suite 841
500 Camp Street
New Orleans, Louisiana 70130

Dear Sir:

This is in response to your letter dated 20 March 1981 which provided a copy of the Draft Environmental Impact Statement (DEIS) concerning two proposed Outer Continental Shelf oil and gas lease sales (OCS Sale Nos. 67 and 69), to the Chief of Engineers, Washington, D.C., which was referred to this District for our review and comments.

12-1 The proposed work appears to involve work requiring a Department of the Army permit and it is recommended you contact Mr. Marcos De La Rosa, Chief, Permit Branch, at FTS 527-6378.

Sincerely,

JAMES H. SIGLER
Colonel, Corps of Engineers
District Engineer

Copy furnished:
Director (540)
Bureau of Land Management
Washington, D.C. 20240

NEW ORLEANS OCS
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MAY 18 1981
STUDIES
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12-1 When operations requiring a Department of the Army permit are contemplated, companies involved in such work routinely contact the applicable U.S. Army Corps of Engineers District Permit Branch.

STATE OF FLORIDA
Office of the Governor
THE CAPITOL
TALLAHASSEE 32301

BOB GRAHAM
GOVERNOR

May 8, 1981

John Rankin, Manager
New Orleans Outer Continental Shelf Office
Bureau of Land Management
Hale Boggs Federal Building, Suite 84
New Orleans, Louisiana 70130

Dear John:

We have reviewed and coordinated a state agency review of the draft environmental impact statement (DEIS) for proposed OCS oil and gas lease sales 67 and 69. Our comments relate to three specific concerns - environmental studies, oil spills, and nearshore/onshore impacts. A fourth set of comments are editorial or minor points for your attention. Please consider these comments in preparation of the final EIS for sales 67 and 69.

A. The State of Florida has repeatedly requested that the Environmental Studies Program be timed to the occurrence of lease sales in the eastern Gulf of Mexico so that necessary data is available to make informed decisions. The use of up-to-date data from completed and ongoing studies, as well as the need for additional studies to obtain new data, is a recurrent theme in the comments given below.

13-1 1. Page 67: Based on recent discussions of the Gulf of Mexico Regional Technical Working Group in New Orleans, it is the understanding of the State of Florida that geologic studies for FY 83 have been eliminated. We suggest these studies be reinserted into the FY 83 Environmental Studies Program.

13-2 2. Page 68: The discussion of the Karst conditions of the West Florida Shelf requires more detail. Preliminary data by Holmes and Doyle indicates the presence of surface pothole-like features off the southwest Florida coast. The relation of these features to geohazards should be more fully explained, since all future BLM/USGS geohazards studies have been terminated by Secretary Watt.

13-3 3. Page 78: The discussion of the Loop Current and the entrainment of surface material is not adequate. There is drift bottle and Loop Current intrusion data which suggests that if an oil spill were to occur on the south

13-3 West Florida Shelf, the east and west coasts of Florida could be easily affected. The path of the Loop Current passes along Florida Bay, through the Straits of Florida, past the Florida Keys to the shoreline of southeast Florida. Sometimes, the current passes through the Keys and back into the Florida Bay. This should be clearly stated in the final EIS. In addition, some generalized flow diagrams of the Loop Current would enhance the discussion.

13-4 4. Page 80: The statement is made that no currently listed endangered or threatened plants are known to occur in the Gulf of Mexico coastal region. A draft report, entitled "Rare, Threatened, and Endangered Plant Species of the Southwestern Florida Coast and Potential Impacts of OCS Activity," has been prepared by Dr. Earl McCoy of the University of South Florida. Funded by the U.S. Fish and Wildlife Service as part of the BLM coastal characterization of southwest Florida, the study shows the presence of 266 rare, threatened, or endangered plant species over the eight southwestern coastal Florida counties. However, none of these species are on the official United States list prepared by the U.S. Fish and Wildlife Service. The final EIS should contain some reference to the study in progress by Dr. McCoy.

13-5 5. Page 81: The live-bottom discussion requires modification. The "Southwest Florida Shelf Ecosystems Study," currently in progress by Woodward-Clyde Consultants, indicates the presence of fairly extensive live bottom at a depth of approximately 100 meters. Although photodocumentation in the study stops at 100 meters, the presence of live bottom may not. We do not agree with the BLM, USGS and USFWS determination on the biological stipulation that there is no significant live bottom below 100 meters. This study as well as others indicates that may not be the case. We request that the final EIS document the scientific basis for this determination.

13-6 6. Page 82: The discussion of the slope and deep oceanic habitat in the final EIS should be updated with the information that is available from an ongoing study entitled "Gulf of Mexico OCS Deep Sea Biology Study." This study spans the Gulf from Naples to Brownsville, Texas, and may provide updated data needed in the general discussion here. Additional sampling stations, needed in the Gulf east of DeSoto Canyon, illustrates the justification for the continuation of timely, ongoing BLM environmental studies.

13-7 7. Page 93: At the present time, there is no evidence indicating any lasting impact on the estuarine-associated fisheries as a result of offshore petroleum development. The baseline data needed to conduct cause-and-effect analysis has never been collected because of the past geographical limitations of the studies by BLM. Studies of this nature should be planned for the eastern Gulf so that cause-and-effect studies can occur in the future.

13-8 8. Page 120: There appears to be a conflict in the discussion of petroleum contamination in the Gulf. There have been studies which indicate that the bottom sediments of Texas, Louisiana, and the western panhandle of Florida have significant levels of petroleum hydrocarbons. Indeed, the central Gulf of Mexico platform study mentioned in the EIS supports our statement. Clarification of this matter should come in the final EIS.

13-9 9. Page 144: The DEIS states that the live bottom areas of the eastern Gulf are less precisely known than the topographic features of the central and western Gulf. This is indeed the case. For this reason, the State of Florida supports live bottom research and requires the biological stipulation relating to these areas.

13-10 B. One of the most common concerns expressed by the State and local governments is the possibility that an oil spill will damage the sensitive coastal environment of Florida. The impacts that a severe oil spill could have on the environmental and economic resources of the State are sobering. We recommend that adequate oil spill clean-up equipment be located in the State to reduce response time and to minimize damage from an oil spill. Other oil spill-related comments are given below.

13-11 1. Page 52: The statement "no oil spills have occurred in this area as a result of previous OCS oil/gas activities that could impact the manatees or their habitat and none are expected as a result of this proposal" is erroneous and should be amended or deleted.

13-12 2. Page 84: The description of general land use characteristics extends in Florida only to the "mid-Florida Gulf" area. The rationale for this is that the southern boundary of the lease area included in this sale is the 26° North latitude line. However, in the event of an oil spill, it is very possible that the lands south of 26° will be affected. The oil spill risk analysis (Appendix D) includes the entire Gulf coast of Florida and part of the southern Atlantic coast (specifically Dade County). Based on this

13-12 coverage as well as the Loop Current and shelf circulation characteristics, the area south of 26° should be discussed in detail in the final EIS. In addition, the cost/risk analysis performed for this sale should include this area.

13-13 3. Page 115: Thank you for listing the assumptions used in developing the oil spill risk analysis. However, we believe that the model currently being used is not adequate for determining oil risk analysis. Florida has recommended studies in FY 80, 81, 82, and 83 to get the data that is needed to develop a good predictive oil spill model. Until the necessary data is obtained, the State will not be satisfied with an inadequate, surface driven oil spill model. This is especially true in light of the fact that the probability of an oil spill greater than 1,000 barrels occurring in the Gulf of Mexico is 99+ percent.

C. The nearshore and onshore impacts that may result from this lease sale in particular and OCS development in general are also of major concern to the State. The following comments point to omissions in the DEIS relating to the discussion of Florida's resources and the impacts that may occur to these resources.

13-14 1. Page 52: The statement is made that the manatee habitat area is 20 miles north of Port Manatee in shallow water, and that because only a slight increase in existing vessel traffic is expected, the possibility of a manatee/vessel collision is very unlikely. Page 79 states that the manatee is migratory and that the manatee population disperses along the coast during the summer months. The statements on page 79 should be incorporated in the discussion of the impact on the Florida manatee (pages 51-52). Also, a statement should be added which explains that manatee/vessel collisions are unlikely because the oil companies are presently required to use channels which have a depth of at least four feet deeper than the drafts of the ships travelling in the channels.

13-15 2. Page 64: The format of Table II-1 is excellent. We recommend a table of similar format comparing the expected socio-economic impacts of the alternatives. The impacts on the short-term economy, long-term economy, tourism, shipping, employment, land use, and residential growth could be addressed.

13-16 3. Page 83: In the discussion of economic conditions and trends, Ft. Myers is a major urban area in Florida and should be included into the list of major population centers along the Gulf coast.

13-17 4. Page 87: Eglin Air Force Base in the Florida panhandle should be included in the shoreline land ownership section found on this page.

13-18 5. Page 91: Table III-1 and its accompanying text fail to mention the ports of Pensacola and Tampa Bay. Both Pensacola and Tampa Bay are major ports. Chemical products are shipped through the Port of Pensacola, and phosphate and petroleum products are shipped through Tampa. Port Manatee should also be listed as it functions as the temporary supply base for exploratory drilling in the eastern Gulf.

13-19 6. Pages 91 and 92: Commercial fisheries in Florida require more description. Some data, such as commercial fish landings. may not be available for Florida specifically. However, the offshore South Florida waters are productive shrimp, lobster, stone crab and finfish fisheries grounds, whose importance to the State of Florida cannot be overemphasized. This deserves particular attention and should be included in the final EIS.

13-20 7. Page 93: The recreation section recognizes the existence of national seashores, parks, wilderness areas, etc. We suggest that a list of the environmentally sensitive or protected areas along the Florida coast be included in the final EIS.

13-21 8. Pages 94, 97: The EIS fails to describe the Florida nearshore area and its recreation and tourism characteristics. This omission must be remedied in the final EIS. Tourism is a major component of Florida's economy, and a more detailed discussion of it is warranted.

13-22 9. Page 101: There seems to be some confusion in the amount of offshore and onshore impacts that the State of Florida may experience from lease sales 67 and 69. This is especially apparent on page 101. Assumption 3 under 2(a) states that production will be gathered by new pipelines to a central point for storage and transfer. Is this central point onshore? The lease stipulations for lease sales 41 and 65 require that all oil be transported to shore via pipeline during production. This assumption needs to be clarified, especially in regard to the first sentence of part 2(b), which states that it is unlikely that oil or gas finds from this sale would economically justify new pipelines to shore.

13-23 10. Page 130: The areas along the coast which have a non-attainment status for one or more compounds should be listed, so that the potential air pollution impacts may be more easily assessed.

11. Page 136: There are a number of points to be made about the general resource requirements section.

13-24 - Land: According to Table IV-9, up to four temporary and three permanent service bases may be required as a result of this sale. This is not reflected in the discussion of acreage which may be needed as a result of this sale. The maximum land use figures expected should be given here.

13-25 - Water Usage: Water supply is an existing problem in Hillsborough County, and may soon be a problem in other South Florida coastal counties. Florida is experiencing rapid population growth, accompanied by an increasing demand for fresh water. Where is the water to be taken from: Manatee County? The availability of fresh water supplies for not only this lease sale but also currently active leases and sales in the future must be confirmed. Please address this in the final EIS.

13-26 - Solid Wastes - Solid waste disposal presents some serious problems in Florida, which has such a high water table throughout much of the State. The nature and disposal of sanitary, non-sanitary, and toxic wastes requires considerable planning and attention, and merits further discussion in the final EIS.

D. Other points for consideration include the following:

13-27 1. Pages 33, 253: The FY 82 budget proposal by the Reagan Administration recommends a zero allocation of funds for the Coastal Energy Impact Program (CEIP) and the Coastal Zone Management (CZM) program. The final EIS should acknowledge that the adverse impacts of OCS development may not be prevented or mitigated through CEIP, and that State and local governments may not have the fiscal resources to plan for these impacts.

13-28 2. Page 41: Section 306 of the Coastal Zone Management Act authorizes grants of not more than 80 percent of the program's administrative costs, not 66 2/3 percent as stated in the DEIS.

13-29 3. Page 42: The final EIS should state that Florida is anticipating approval of its Coastal Zone Management plan in August, 1981.

13-30 4. Page 43: The Land and Water Conservation Fund is another federal program which is facing several proposed changes by the Reagan Administration. Any changes finalized prior to the publication of the final EIS should be included in the

13-30 final statement, as the "continued and increasingly important relationship between offshore oil/gas development and enhancement of America's recreation estate" will no longer exist.

13-31 5. Page 77: Under Wind Speed, should A read "Northwestern Gulf Coast"?

13-32 6. Page 77: Reference is made to the final EIS for 58A in the discussion of Gulf of Mexico climatic conditions. In general, references to previous EIS prepared for the eastern Gulf should be limited to recent statements. The final EIS for 65 was well done, with pertinent information, and is generally widely distributed throughout the State, while the distribution of earlier EISs at the local government level is extremely limited.

13-33 7. Page 88: It would be useful to have a definition of the term "undeveloped shoreline" found in the table on this page.

13-34 8. Page 90: The first sentence at the top of this page may need rewording. It is not clear whether there have been 30 years of exploration in the entire Gulf of Mexico, or the eastern Gulf itself.

13-35 9. Page 108: Table IV-5 is unclear. Which set of statistics are the numbers and which is the volume? Those need to be labeled.

13-36 10. Pages 173-175: The list of the agencies and groups receiving the DEIS for lease sales 67 and 69 is outdated. Please replace it with the following lists:

State and Local Agencies:

Florida

Governor's Office
Governor's Energy Office
A-95 Clearinghouse
Florida Department of Commerce
Florida Department of Environmental Regulation
Florida Department of Environmental Regulation,
  Office of Coastal Management
Florida Department of Natural Resources
Florida Department of State
Florida Department of Veteran and Community Affairs
Florida Game and Fresh Water Fish Commission
Florida Institute of Oceanography
Manatee County Port Authority

Monroe County, Planning and Zoning
North Central Florida Regional Planning Council
Sarasota County, Florida
South Florida Regional Planning Council
Southwest Florida Regional Planning Council
Tampa Bay Regional Planning Council
West Florida Regional Planning Council
Withlacoochee Regional Planning Council

Groups:

Collier County Conservancy (Florida)
Florida Audubon Society
Florida Petroleum Council
Florida Wildlife Federation
Manasota '88 (Florida)
Sanibel-Captiva Conservation Foundation (Florida)
Sierra Club (Florida)
State Association of County Commissioners of Florida, Inc.

13-37 Attached to this letter are the comments this office received from State agencies, regional planning councils, local governments and private groups, regional planning councils, and private groups. Specifically, the Florida Departments of Commerce and Natural Resources, Southwest Florida Regional Planning Council, Withlacoochee Regional Planning Council, City of Cape Coral, the Sierra Club - Coastal Task Force, and Manatee County Port Authority submitted comments. Please consider these as part of the State of Florida's comments, and respond to them in the final EIS. Additional letters from other agencies will be forwarded to you soon. We request these be included in the final EIS and treated in the same manner as the above comments, if possible.

Thank you for providing us the opportunity to review and comment on the DEIS. Please call if we can be of any assistance to you in making some of the changes noted above.

Sincerely,

Murice O. Rinkel
Florida OCS Representative

MR/mew

cc: Roland H. Eastwood
Shirley Taylor
Jackson E. Sullivan
James E. Newton II
Wynnelle Wilson

cc: Karen Steidinger
Art Wilde
J. E. Jaudon

13-1 Geological studies have not been eliminated from the FY 83 Environmental Studies Program. An example is Study No. G-333 in the FY 83 Regional Studies Plan entitled "Gulf of Mexico Continental Slope Geological Investigations."

13-2 Previous seismic data collected by USGS, Metairie and Corpus Christi, and the MAFLA studies have shown a widespread, but noncontiguous distribution of karst features on the west Florida platform from the Florida Middle Ground to the Florida Keys. Surface expression of the karst is evidenced in some areas; while in other locales, subsurface karst is inferred from the seismic anomalies. Total depth of the carbonate strata is approximately 15,000 feet on the west Florida platform; however, the depth of possible karst development is undefined without appropriate data on sea level/water table variations as they may have affected the carbonate platform.

Karst should be noted as an engineering constraint, but has little credence as a geohazard. Pressurized gas within karst is rare; therefore, the chances of blowouts are minimal. Collapse of a doline feature is possible, and if a structure is located directly over the feature, such a collapse could present a risk of loss of structure, well, and a potential oil spill. However, prior to exploration and production a detailed siting program and plan, including seismic data, is made available by industry to the Conservation Division of USGS for acceptance and permitting. These steps will preclude siting over a collapsible structure.

Proximity of a structure to a suspected karst feature could be cause for modification and/or rejection of the development plan and siting. The known influence of karst on oil and gas development has been in drilling. Karst presents a notable engineering problem to industry through the loss of drilling mud circulation in the wellbore when penetrating a doline cavity. This problem has been encountered several times by industry in exploratory drilling on the Florida platform. Since the severity of the problem is proportional to the rate of loss of drilling mud, which may range from an amount too slight to be noticed to a complete loss of circulation, corrective measures are advised if completion of the well to its designed depth is desired. These measures include either changing the mud program to reduce the mud loss to one that can be tolerated or casing the cavernous area so that drilling may continue. This problem of lost returns, which is frequently encountered in drilling wells, is impossible to predict as conditions vary from place to place. While modern geophysical surveys can be designed to detect cavernous limestones and karst features near the surface, deep caves causing loss of circulation are nearly impossible to detect prior to drilling.

13-3 Please note our response to Comment 16-1 which provides further discussions regarding the entrainment of surface material in the Loop Current. Although we have drift bottle and satellite data available to aid us in our analysis, as well as geostrophic calculations, we cannot consider this information to be fully descriptive of the possible effects of oil spills. There is in fact a need to merge this information with more strategically obtained data such as time-series current measurements both on the shelf and in the deep ocean. When we are able to realize this additional information through study programs and integrate it with circulation models, we will be able to assess the effects of phenomenon such as loop current intrusion, eddy shedding, eddy decay, shelf forcing, etc., on oil spills. Although we can differentiate and partially describe these phenomenon, we cannot describe their effects in relation to oil spills in detail until additional information is obtained.

13-4 The information pertaining to endangered/threatened plants in southwestern Florida is appreciated, but the referenced study is not currently available to the public and data sources referenced in the EIS must be readily available for public review. As you have indicated, none of these plant species are officially listed by the U.S. Fish and Wildlife Service currently.

13-5 We agree that live bottom areas may exist below the 100 m water depth, but we doubt that any such areas would contain the biological communities necessary to qualify them for extraordinary and expensive procedures and restrictions of the live bottom stipulation. The findings to date of the "Southwest Florida Shelf Ecosystems Study" are very tentative and preliminary and have not yet undergone the necessary integration and analysis to allow us to draw conclusions upon which to base regulatory decisions. (When these analyses are made and after the continuation of the study does look at areas in 100-200 m depths, we will be in a better position to consider this concern.) In the meantime, all the evidence regarding deep benthic communities does not warrant the application of the stipulation.

13-6 Thank you for your comment. The discussion of the slope and deep oceanic habitat has been updated as you suggested.

13-7 Thank you for your comments. It is suggested that plans for studies of this nature be discussed at the next Regional Technical Working Group meeting.

13-8 Studies conducted through BLM's environmental program have not, to the knowledge of the environmental staff, shown "significant" levels of petroleum hydrocarbons in the bottom sediments in much of the Gulf of Mexico as stated. Results of the MAFLA Study (Section I.F.) are two-fold: Samples from the Mississippi/Alabama region indicate a low level but distinct presence of fossil fuels. The Florida shelf area results show no oil pollution. The South Texas Outer Continental Shelf (1975-1977) Study results indicate the seawater and sediment samples from the study are relatively pristine with respect to petroleum hydrocarbons.

The discrepancy between the conclusions of the STOCS Study and those that your agency has acknowledged emphasizes that research attempting to quantify or evaluate accurately the specific effects of hydrocarbons, particularly quantitatively, are in an infancy stage. What is a "significant" level of petroleum hydrocarbons?

It is not that the need to evaluate or compare Gulf of Mexico environmental studies is not considered important, rather the strategy taken to compare scattered Gulf-wide studies must be approached carefully. The mentioned Central Gulf of Mexico Platform Study has, in fact, not yet submitted their final report, and they will compare their final conclusions with hydrocarbon concentrations results of other studies. Of particular concern is the fact that analytical methodologies used to determine hydrocarbon concentrations have varied so much among research over the past 10 years. New state-of-the-art methodology allows a sophistication of detection not possible until very recently. The capability to identify more components at lower concentrations is continually improving. Aromatic components, an indicator of petroleum contamination, is not easily examined without gas chromatography/ mass spectrometry techniques which were not used in BLM studies until the most recent research. Therefore, comparisons among studies examining different locations are difficult.

Before the determination of possible adverse impacts caused by the presence of low-level, multisource sediment hydrocarbons in the Gulf of Mexico can be addressed, these results must be compared to known biological effects in the range of concentrations measured. The degree of influence from probable inputs include natural seepage, the Mississippi River discharge, the density of petroleum platforms, and tankering routes. The present level of scientific knowledge makes it difficult to predict the complete chemical behavior of sediment hydrocarbons.

It is the sincere hope of the Environmental Assessment Division of BLM's New Orleans OCS Office that, by the writing of the next EIS, effort towards completing some or all of these above criteria will be substantial enough that this issue of concern can be addressed better.

13-9 We agree that live bottom research should continue and that the stipulations should apply to eastern Gulf of Mexico tracts in 100 m water depth or less.

13-10 Thank you for your comment. Please see our response to Comment 14-3.

13-11 The statement has been revised to indicate that a minimal number (0.37) of oil spills are expected to occur as a result of this proposal.

13-12 The oil spill analysis for combined OCS Sales 67 and 69 indicates that there is negligible probability that an oil spill starting in any of the tracts being offered will contact the southwest coast of Florida. For this reason, and because it is estimated that there will be no other potential impact producing factors (i.e., onshore operations/facilities) located or contacting the area south of 26°N latitude, land use information for the area was not included.

13-13 We feel that the Oil Spill Risk Analysis model presently used (provided by USGS) is useful in the assessment of risk and potential impacts. We realize the need for more sophisticated analysis techniques, as well as the need for more descriptive oceanographic information; however, we cannot let this need cloud our thinking at the present. Although it may not be as advanced as we would like, we have at our disposal a very useful tool which allows us to aid the decisionmaker and analyst. If we dismiss its utility due to the fact that it is not in an idealized form, we have no tool with which to do our analysis or aid us in the decisionmaking process. If, however, we understand the limitations of our tool and use it accordingly until we have these more sophisticated techniques and additional oceanographic information available to incorporate into it, we can optimize the utilization of our resources to the best possible extent.

We are actively pursuing methods by which we can enhance the capability of the model and improve its data base. This is a very time consuming and costly effort, and we would greatly appreciate any data you may have access to and/or recommendations you may have as to methods of obtaining or integrating needed information.

13-14 The statement has been revised to indicate that the major manatee habitat is 20 miles north of the port in shallow water, that service vessels are presently required to use channels which have a depth at least four feet deeper than the vessel's draft, and only a slight increase in existing vessel traffic is expected to occur; therefore, the possibility of manatee/vessel collision is very unlikely.

13-15 Table II-1 is intended to compare the various alternative plans regarding the major areas of environmental concern. These areas of interest were determined through a detailed scoping process, the results of which are discussed in Section IV.D.1. of the EIS. While information on impacts of lesser significance could easily be included in Table II-1, it is our opinion that such data would not be useful in analyzing the alternative plans and, furthermore, in determining the most environmentally sound action. In fact, additional comparisons which are not necessary to accomplishing the objective of the EIS may impede the reader in evaluating the alternative plans by detracting from the major issues of concern. Finally, all the areas of socioeconomic impact, regardless of magnitude, are addressed in Appendix B of the DEIS. A reanalysis of these evaluations since the DEIS has resulted in no changes. For all of these reasons, we have not included the socioeconomic impacts described in the question above within Table II-1, thereby, limiting that table to significant areas of concern.

13-16 Ft. Myers was mistakenly excluded from the list of major population centers in the Florida portion of the study area. Section III.C.1. now includes this listing.

13-17 Text has been changed to include reference to Pensacola Naval Air Station, Eglin Air Force Base, and Tyndall Air Force Base.

13-18 Table III-1 and the accompanying text have been revised based on your comments. Also, Port Manatee has been discussed as an existing supply base as well as a likely site for expansion if Sales 67 and 69 occur. This analysis is contained in Section IV.C.3.a.

13-19 Thank you for your comments. Section III.C.5. of the FEIS now includes an expanded discussion of the commercial fishery of the study area.

13-20 Sections 1500.4 and 1502.15 of the NEPA regulations specifically discourage the listing of species, areas, etc., associated with the potentially affected environment. For brevity sake we have attempted to specifically mention categorical environmentally sensitive, protected, and recreational areas on page 93 of the DEIS, as well as in the Summary Impact Assessment (Appendix B of the DEIS) and have incorporated specific sites by referencing OCS lease sale visuals, State Comprehensive Outdoor Recreation Plans, State Coastal Zone Management Plans, and Coastal Characterization reports. Although there is some measure of risk for adverse impact to all shoreline recreational and designated environmental preservation areas as expressed in the oil spill model, expected adverse impact to specific Florida resource areas does not warrant a detailed comprehensive listing of these areas in Sections III or IV.

13-21 As noted in a prior response, NEPA regulations discourage exhaustive discussions of the affected environment. We have attempted to acknowledge and emphasize the vital importance of the Gulf of Mexico coastal area and shorefront, along with its varied resources to recreation and tourism in Section III.C.6. (pp. 93-100 of the DEIS). We are remiss, however, in not relating in more detail the importance of tourism to Florida's economy. Over 35 million tourists visit your state each year, and a major attraction for these visitors are Florida's beautiful sandy beaches and abundant, lush natural diversity as is evidenced in coastal conservation and preservation areas. We have added a discussion in the FEIS relating the importance of tourism to Florida coastal counties facing the eastern Gulf of Mexico.

13-22 The assumption stated in Section IV.B.2.a.(3) is sales specific (referring to the proposed Sales 67 and 69) and can be applied to offshore as well as onshore storage and transfer. In reality, both cases are possible, i.e., that oil production initially could be serviced by an offshore storage/tanker system until such time that additional production would make it economically feasible to construct a trunk line to an onshore storage and terminal facility. As stated under the cumulative impact assumptions, it is considered unlikely that Sales 67 and 69 would, by themselves, result in oil finds of sufficient magnitude to economically justify construction of a trunk line to shore. However, the cumulative effect of several other sales (e.g., Sales A66, 66, 72, and 74) in addition to Sales 67 and 69 "could contribute to the eventual construction of a trunk pipeline with a landfall on the west coast of Florida." This cumulative impact assumption is included in Section III.C.3.a. and Table IV-9 (pp. 134 and 135 of the DEIS).

13-23 It would be inadequate to list nonattainment status for any one compound and inappropriate to the list the nonattainment status for all applicable compounds for the entire region of concern when this information is presented in its entirety, and is easily understood and referenced (40 CFR Part 81).

13-24 A maximum of four service bases are estimated to be required (use of the same service bases for exploratory drilling and development/production operations is assumed). It is estimated that Port Manatee would accommodate at least two service bases with little or no expansion of the existing developed port area. The additional two service bases, under the maximum condition, are estimated to require 2.5-5.0 acres per site on a total of 5.0-10.0 acres as stated in Section IV.C.3.b.(1) (p. 136 of the DEIS).

13-25 The availability of an adequate supply of water is an important element or constraint in locating a service base facility. Sufficient water must be available to support a service base at a particular site. For the proposed sales an estimated maximum of 0.0712 MGD (annual average) of treated water would be needed in support of the Florida shelf offshore development activity (this is for the peak year, 1984). If all the service base requirements were met from Port Manatee, it is assumed that the needed water would be supplied from the Manatee County water service districts. This district water supply capacity reported at 27.5 MGD and an annual average daily consumption of 19.1 MGD by the Tampa Bay Regional Planning Commission in the report, Regional Economic Development Plan, June 1978. The water required in support of the OCS offshore activity represents less than 0.3% of the system's reported capacity and consumption.

The question of whether there will be sufficient water to support future service base operations at Port Manatee would be addressed subsequent to the lease sales at the time the required Exploratory Drilling Plans and Environmental Reports are submitted to USGS for review and approval. These plans and reports must describe proposed offshore and onshore operations and facilities and other requirements, including the estimated amount of water consumption. USGS will prepare an environmental assessment (EA) of the potential impacts of the proposed operations; an EIS will also be prepared if the EA indicates that approval of the plan would subsequently affect the human environment. Furthermore, states with an approved Coastal Zone Management (CZM) plan (Florida's plan is expected to be approved this year) are required to make a determination that the proposed exploration plan is consistent with the CZM plan. This procedure should assure that state and local officials have the opportunity to review and approve, or disapprove, plan elements such as water use.

13-26 As you note, disposal of solid and/or hazardous wastes is a serious problem, especially in Florida because of geologic and hydrologic considerations. At present, disposal of nonhazardous solid wastes is handled in accordance with state regulations under the auspices of the Florida Department of Environmental Regulations; disposal of hazardous materials is not presently permitted. The state of Florida is presently in a cooperative agreement with EPA to promulgate state codes in compliance with EPA's criteria and guidelines for disposal of hazardous materials.

Disposal of solid nonhazardous wastes from offshore activities may be handled using existing facilities (sanitary landfills) operated by private concerns, counties, or municipalities. Should the operators of these facilities question the nonhazardous nature of the materials, they may refuse to accept wastes for disposal pending results of tests. Should the volume of waste materials require development of a new landfill, that landfill must be designed and planned by a state-registered engineer, and application for permit to operate is made to the district office of the Florida Department of Environmental Regulation. Public notice is given, and a public hearing is scheduled if warranted. Based on comments received and determinations of the staff, the landfill may be approved or denied.

Procedures for disposal of hazardous wastes are not presently finalized, but will probably be handled in a somewhat similar manner at sites or facilities ultimately approved by the state for disposal of designated hazardous wastes.

13-27 Thank you for your comment. The text has been changed to incorporate this information.

13-28 Thank you for your comment. The suggested correction has been made.

13-29 Thank you for your comment. The text has been changed to reflect this information.

13-30 It is true that the Land and Water Conservation Fund is among those social programs affected in current attempts at fiscal restraint and national security. The Administration's intent, as often expressed by the Secretary of the Interior, is not to abolish the Fund but to redirect the focus of dedicated OCS recreation monies towards improving the real estate already acquired to facilitate public access and enjoyment of our established national parks system. Whatever the outcome, the direct recreational implications of OCS oil and gas development (DEIS 67 and 69, Section IV.D.1.c.) and over $3 billion of OCS revenues invested in public recreation since 1965 has, and will continue to have, a profound and lasting influence on public recreation in America.

13-31 Thank you for your comment. The text has been corrected.

13-32 Thank you for your comment. A reference to the FEIS for Sale 58A has been added to the text.

13-33 The table to which you refer was extracted from BLM's 1975 Programatic FEIS for the proposed increase in oil and gas leasing on the OCS. Although no precise definition is provided in the 1975 document, it would appear that the table was derived from the Corps of Engineers' 1971 National Shoreline Inventory and would include all undeveloped Gulf of Mexico shorefront, bay, and estuary shoreline potentially suitable for development (1970 data).

13-34 The wording has been clarified.

13-35 Thank you for your comment. Please see our response to Comment 3-5.

13 36 Our mailing list will be updated in accordance with your suggestion.

13-37 Thank you for these additional comments. We are responding to them in the manner you requested.

BOB GRAHAM
GOVERNOR

STATE OF FLORIDA
Office of the Governor
THE CAPITOL
TALLAHASSEE 32301

NEW ORLEANS OCS
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ROUTE INITIAL
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STUDIES
MGMT. SER.

May 13, 1981

Mr. John Rankin, Manager
New Orleans OCS Office
Bureau of Land Management
500 Camp Street, Suite 841
New Orleans, Louisiana 70130

Dear Mr. Rankin:

Enclosed are comments on the draft environmental impact statement for OCS lease sales 67 and 69 received from the Sarasota County Planning Department. Please attach these to the May 8th letter sent to you from this office. Consideration of Sarasota County's comments in the final environmental impact statement is appreciated.

Sincerely,

Elizabeth A. Hodecker
Governmental Analyst

EH/mew

Enclosure

cc: James E. Newton II
Douglas James

Southwest Florida Regional Planning Council

2121 West First Street, Fort Myers, Florida 33901 (813) 334-7382

Ms. Elizabeth Hodecker
Office of Planning and Budgeting
Office of the Governor
The Capitol
Tallahassee, FL 32301

RE: A-95 #81-120 EIS FOR PROPOSED OCS OIL AND GAS SALES 67 and 69

Dear Ms. Hodecker: May 11, 1981

Attached are comments on the above-noted project received from the Sarasota County Planning Department.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Jim Newton
James E. Newton II
A-95 Coordinator

JEN/je

Attachment

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COUNTY OF SARASOTA
FLORIDA

BOARD OF COMMISSIONERS

COMMISSIONERS:
JERRY L. HENTE · DISTRICT 1
BEVERLY CLAY · DISTRICT 2
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ROBERT L. ANDERSON · DISTRICT 5
ED MARONEY · COUNTY ADMINISTRATOR

P.O. BOX 8
SARASOTA, FLA. 33578
PHONE: 813/365-1000

RECEIVED
MAY 8 1981
S.W. FLORIDA REGIONAL PLANNING COUNCIL

May 5, 1981

Mr. Roland Eastwood
Executive Director
Southwest Florida Regional Planning Council
2121 West First Street
Fort Myers, Florida 33901

Dear Mr. Eastwood:

We have reviewed OMB Circular A-95 #81-120, "Final EIS for OCS Oil and Gas Proposed 1981 Sales 67 and 69", in response to your request of April 14, 1981. The proposed sales and related exploratory operations are to take place in Federal waters beyond the jurisdiction of Sarasota County's plans and programs. Problems could arise concerning consistency with local plans, programs, and development proposals should transmission pipelines and on-shore service facilities be considered.

14-1 Mr. Rob Patten, Marine Biologist with Sarasota County's Coastal Zone Management Division strongly recommends that oil spill containment and clean-up equipment be located in the Tampa Bay area (not just in the New Orleans area) prior to the commencement of OCS oil production operations off Florida's Southwest Coast. Mr. Patten's comments on the application are attached for your information.

Thank you for this opportunity to comment. If any additional information or clarification is necessary, please contact Dennis Wilkison, Senior Planner, at (813) 365-1000, ext. 367.

Please include a copy of this letter in your response to the appropriate reviewing agencies.

Sincerely,

Douglas James
Douglas James, Director
Sarasota County Planning Department
2086 Main Street
Sarasota, Florida 33577

DJ:jn
Xc: Commissioner Beverly Clay
Commissioner Robert Anderson

81-120

COUNTY OF SARASOTA

INTER OFFICE MEMO

TO : H. M. Place, Assistant Director of Planning

FROM: Robert B. Patten, Assistant Director, Office of Coastal Zone Management

DATE: May 3, 1981

SUBJ: A-95 Review—D.E.I.S. OCS Oil & Gas Proposed Sales 67 and 69

Attached is an abbreviated Findings of Fact that this office would like to submit to the Southwest Florida Regional Planning Council for their inclusion in their review of the D.E.I.S. OCS Oil and Gas Proposed Sales 67 and 69.

Sarasota County has maintained a strong and viable interest in any oil and gas activity in the Gulf of Mexico for quite some time. In fact, when the Department of the Interior requested oil and gas companies to indicate tracts in the Gulf that they would be interested in leasing for the purpose of oil exploration in 1973, the Board of County Commissioners passed a resolution opposing offshore exploration and drilling in the eastern Gulf of Mexico. A copy of that resolution is attached to the Findings of Fact.

Today, as in 1973, Sarasota County still feels that the prospect of offshore drilling raises serious questions of considerable importance to Florida. These include the effects that drilling might have on the Gulf of Mexico environment, fishing and tourism in the area. Hazards associated with the drilling for gas and oil, such as spills, discharges and escapes of pollutants still pose threats of great danger and damage to the environment of the county. The values of our beautiful beaches have been well documented in terms of uses for public and private recreation and the subsequent tourist industry that these opportunities afford. The county feels that preserving the integrity of the shoreline so as to accommodate this use is a matter of the highest priority, and that such use can only be served effectively by maintaining the coastal waters, estuaries, tidal flats, beaches and public lands adjoining the seacoast in a close to a pristine condition as possible. The drilling for gas and oil in the Gulf of Mexico off the coast of Sarasota is inconsistent with the present utilization our beaches are experiencing.

Because offshore oil operations close by would threaten the tourist-oriented economy and the residential desirability of this area, the county strongly opposes explorations in the areas proposed.

14-2 Finally, our review of the D.E.I.S. for OCS Oil and Gas Sales, (Tracts 67 and 69) finds that many of our environmental concerns are highlighted in the document. However, the conclusions reached (as to probable impacts of spills, seepage, etc.) do not adequately state the case. We would argue that even though the probability of an environmentally damaging occurrence is quite low, the subsequent physical estuarine damage and concurrent economic costs are unacceptably high. It would be our recommendation that Alternative B-1, the elimination of the offshore Florida tracts from the sale, be implemented.

RBP:jn
xc: Ed Maroney, County Administrator
Jeffrey L. Lincer, Ph.D., County Environmental Specialist

FINDINGS OF FACT AS IT RELATES TO OCS OIL AND GAS PROPOSED SALES, TRACTS 67 AND 69

1. Oil released in Florida's coastal waters in any large quantity would have serious environmental effects. Reefs, mangrove and marsh areas, and beaches could be severly damaged or destroyed. Florida's abundant fish and wildlife population would suffer extensive losses. Water may also be polluted through dredge and fill activities, offshore construction of platforms, discharges during drilling activities, and storm water run-off from any onshore support facilities.

2. Sarasota County's economy is largely dependent on tourism, and the beauty of the water, air, beaches, and coastal areas is essential for its economic well-being. Anything which threatens these resources in turn threatens the economy of the county.

3. Our first principal concern about off-shore drilling is the most obvious, a large blowout or pipeline rupture. We do not feel that the corrective responses proposed by the oil industry are fully adequate. Chemical dispersants are variable in their action, sinking agents are not generally successful, and contaminant booms are inadequate. Especially in regards to the booms, we feel that much engineering development remains to be done to provide a fully effective system in rough water.

4. Of equal importance to marine and human resources are the destruction of coastal land use or natural ecosystems by the arrival of the oil industry. The impacts of this activity are addressed more fully in the attachment of the Planning Department's report on local land use impact.

14-3 5. The operation of an offshore structure may allow a very high degree of water degradation. Such degradation has previously resulted from seepage and spillage from offshore oil wells and drilling operations, and has been well publicized. As stated in the Department of the Interior's Environmental Impact Statement, on the OCS Oil & Gas Proposed 1981 Sales, dated July 1980, the areas of greatest risks for a spill of greater than 1000 barrels are the Mississippi Delta and the Florida Gulf Coast. The D.E.I.S statement goes on to say the leasing of all tracts proposed under Alternative A for Proposed Sales, 67 and 69, would result in one oil spill greater than 1000 barrels during the 30 year life of sale related production. A spill impact on the Florida coast would probably not landfall within 10 days of occurrence. Sarasota County finds this condition to be totally unacceptable.

14-4 6. Sarasota County supports the implementation of Alternative B-1 (page iii, Summary, D.E.I.S.) which would eliminate 126 tracts. These tracts include 77 oil/gas-prone tracts off Charlotte Harbor, Florida. This alternative would result in a total elimination of risk of an oil spill reaching the Florida coast from the Charlotte Harbor tract group.

81-120

81-12

RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS
OF SARASOTA COUNTY, FLORIDA

RE: OFF-SHORE OIL DRILLING IN THE GULF OF MEXICO

WHEREAS, the Department of the Interior has requested oil and gas companies to indicate those Tracts in the Gulf off the coast of Florida that they would be interested in leasing for the purpose of oil exploration and drilling; and

WHEREAS, these "nominations have recently been submitted for assessment, previous to a determination of which Tracts will be considered for offering on a competitive bid basis;" and

WHEREAS, before such action, several further steps will be required including environmental assessments and the preparation of environmental impact statements; and

WHEREAS, the prospect of off-shore drilling raises questions of considerable importance to Florida including the effects on the Gulf of Mexico environment, fishing and tourism in the area; and

WHEREAS, Floridians are to be accorded an opportunity to secure answers to these questions in the initial stages of the process and respond accordingly; and

WHEREAS, those vast areas of Gulf bottoms off-shore of Sarasota County have become the most important single public asset in that said areas provide for the use and benefit of the public an area of natural resources available for fishing, beach bathing, boating and other recreational usage, as well as an area for the conservation of wildlife, fish and other marine life; and

WHEREAS, the past and anticipated future increases in population, accompanied by the expansion of the needs and demands of the public for outdoor recreation; the increased demands for the production of fish and other marine life; the vastly expanding tourist industry, accompanied by the necessity to conserve and protect existing wild and marine life, have emphasized that the public health and welfare will be most beneficially served by not granting off-shore leases to oil and gas companies.

NOW, THEREFORE, BE IT RESOLVED by the BOARD OF COUNTY COMMISSIONERS OF SARASOTA COUNTY, FLORIDA, in public meeting assembled:

1. That the Department of the Interior as the Government's primary agent for natural resources with statutory responsibility for leasing and managing federally-owned off-shore lands specifically in the Bureau of Land Management and the Geological Survey, are hereby respectfully requested to identify for adequate review, evidence that any program of oil exploration or oil drilling is developed in cooperation with relevant Federal agencies, State agencies, local governments and all other interests; and

2. That the Board of County Commissioners of Sarasota County is unalterably opposed to off-shore exploration and drilling in the eastern Gulf of Mexico, and will not favorably consider rezoning or other governmental actions to provide ancillary support facilities.

3. Inasmuch as the problems of oil exploration and oil drilling are ones that may adversely affect all the counties on the lower west coast of Florida in general and Sarasota County in particular in varying degrees, therefore it is respectfully requested that the Counties so affected be afforded an opportunity to review and study any proposed leases in the eastern Gulf of Mexico, so as to determine whether or not it is in the best interest of the citizens of the State of Florida and their respective counties to request the Department of Interior to not grant leases for the possible initiation of oil drilling.

4. The Clerk to the Board is hereby authorized and instructed to forward a copy of this Resolution to the Board of County Commissioners of Pinellas, Manatee, Charlotte, Lee and Collier Counties.

5. That the County Administrator is hereby authorized and directed to present this Resolution to the Department of Interior Symposium at Panama City, Florida on May 24, 1973.

This Resolution shall become effective immediately upon its adoption.

PASSED AND DULY ADOPTED this 22nd day of May, A.D., 1973.

BOARD OF COUNTY COMMISSIONERS OF
SARASOTA COUNTY, FLORIDA

Chairman

ATTEST:

R. H. HACKNEY, JR., Clerk of
the Circuit Court and Ex-Officio
Clerk of the Board of County
Commissioners of Sarasota County,
Florida

Grace Jonston
Deputy Clerk

I, R. H. HACKNEY, JR., CLERK OF THE CIRCUIT COURT AND CLERK EX-OFFICIO, BOARD OF COUNTY COMMISSIONERS, DO HEREBY CERTIFY THAT THE ABOVE AND FOREGOING IS A TRUE AND CORRECT COPY OF THE ORIGINAL AS IT APPEARS IN THE OFFICIAL FILES OF THE BOARD OF COUNTY COMMISSIONERS OF SARASOTA COUNTY, FLORIDA.
WITNESS MY HAND AND SEAL OF SAID COUNTY THIS 23rd DAY OF May A.D. 19 73
R. H. HACKNEY, JR., CLERK OF CIRCUIT COURT EX-OFFICIO CLERK OF THE BOARD OF COUNTY COMMISSIONERS, SARASOTA COUNTY, FLORIDA
BY Grace Jonston
DEPUTY CLERK

14-1 Thank you for your comment. Mr. Patten's recommendation should be conveyed to your appropriate state agency for further consideration.

14-2 Thank you for your comment. We believe that the potential environmental impacts due to these two oil and gas lease sales are adequately and accurately stated in this EIS, as are the projected probabilities of an oil spill and the resulting potential environmental damages.

Your recommendation to implement Alternative B-1, the deletion of 126 tracts to protect biologically sensitive areas (including 77 oil and/or gas prone tracts off Charlotte Harbor, Florida), is hereby noted and becomes an official part of this EIS.

The Secretary of the Interior, in making his decision which tracts to offer for these lease sales, will consider all recommendations and issues developed in this EIS. Additionally, the Secretarial Issue Document (SID) prepared by this office will provide the Secretary with a synopsis of major issues of concern regarding these proposed lease sales. Your recommendation for implementing Alternative B-1 will be reflected in the SID to be transmitted to the Secretary in August/September 1981.

14-3 Thank you for your comment.

14-4 Thank you for your comment. See our responses to Comments 15-2, 18-1, and 18-10.

STATE OF FLORIDA

Office of the Governor

THE CAPITOL
TALLAHASSEE 32301

BOB GRAHAM
GOVERNOR

May 14,1981

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MGR.
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MAY 18 1981
LEGAL
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OPS
STUDIES
[illegible] SER.

Mr. John Rankin, Manager
New Orleans Outer Continental
  Shelf Office
Bureau of Land Management
500 Camp Street, Suite 841
New Orleans, LA 70130

Dear Mr. Rankin:

Enclosed are comments on the draft environmental impact statement for OCS lease sales 67 and 69 received from the West Florida Regional Planning Council. Please attach these to the May 8 letter sent to you from this office. Consideration of the West Florida Regional Planning Council's comments in the final environmental impact statement is appreciated.

Sincerely,

Elizabeth A. Hodecker
Governmental Analyst

EAH:dmc

Enclosure

cc: D.T. Raynor

WEST FLORIDA
REGIONAL PLANNING COUNCIL
5904 NORTH 9TH AVENUE • POST OFFICE BOX 486
PENSACOLA, FLORIDA 32503 • PHONE (904)478-5870

DANIEL F. KRUMEL
Executive Director

BILL W. PEEBLES
Chairman

RAY W. WAGNER
Vice Chairman

13 May 1981

RECEIVED
MAY 14 1981

Ms. Elizabeth Hodecker
Governmental Analyst
Office of Planning & Budgeting
Office of The Governor
The Capitol
Tallahassee, Florida 32301

RE: Draft Environmental Impact Statement, Proposed Oil and Gas Sales 67 and 69

Dear Ms. Hodecker:

As per our telephone conversation and earlier conversations with Debbie Blizzard and Murice Rinkel, we have reviewed the above referenced document and offer the following remarks/comments/questions. This staff has not been involved with the entire offshore oil leasing process, therefore, reading and understanding much of this material has been difficult. It is very difficult to offer substantive comments without more background, however, the following comments/remarks are offered.

1. Much of the Draft appears to be straight forward. Substantive comments concerning the technical discussions cannot be generated by this staff due to lack of expertise in geology, etc.

15-1 2. It appears that Pensacola may be impacted only by tracts 121, 122, 123, 124, 125, 128, 129, 130, and 131 of sale number 69 and by tracts 103, 104, 105, 137, 128, 129, 130, and 131 of sale number 67. Are there any extra biological stipulations for these tracts?

3. The review time is not long enough to thoroughly review all the information submitted for review. There is no time allowed to solicit input from the local public interested in OCS programs.

15-2 4. The EIS does not consider cumulative impacts if strikes are made in more than one area or if more than one spill occurs at any one time or if more than one oil spill occurs in the same area. It would be more useful to have an evaluation of cumulative impacts than an evaluation of what the chances are for an accident.

"... serving Escambia, Santa Rosa, Okaloosa, Walton and Bay Counties and their municipalities"

Ms. Hodecker
Page -2-
13 May 1981

15-3 5. Is adequate oil spill equipment available throughout Florida? Does every test and operating well have adequate oil spill equipment?

15-4 6. The impact statement appears to be written for any oil/gas lease. What specific impacts can be anticipated on the Gulf Coast of northwest Florida?

15-5 7. If a strike should be made on any of the above listed tracts, what is the sequence of events/actions that would be expected from local elected officials to protect or preserve environmental quality?

If you have any questions concerning these comments, please call.

Sincerely,

D. T. Raynor

D. T. Raynor
208 Project Director

DTR:hc

15-1 The tracts listed in the comment for proposed Sale 69 are included under the stipulation for the eastern Gulf of Mexico (Section I.C.2.b.). The tracts listed in the comment for proposal Sale 67 are not covered by the stipulation because these tracts are not believed to be in areas of potential live bottom.

15-2 Page 281 (Appendix D) of the DEIS for Sales 67 and 69 addressed the question of cumulative impacts by giving the expected numbers of spills, most likely number of spills, and the probability of one or more spills relative to Sales 67 and 69, existing leases, existing and proposed leases, and waterborne transportation over the entire lease life of Sales 67 and 69. Tables 11-13, Tables B-1 through B-3, Figures C-1 through C-10, and Tables E-1 through E-2 can all be utilized to assess cumulative impacts.

15-3 Although the eastern OCS area is not, at present, a major location of petroleum exploration or development, the state of Florida has wisely anticipated the need for oil spill contingency planning. Florida oil containment provisions are extremely sufficient to provide rapid responce to accidental petroleum discharges.

The state of Florida has developed a Florida Coastal Pollutant Spill Contingency Plan to provide a coordinated response by state government agencies. This document is available through the Florida Department of Natural Resources and outlines the operational response and cleanup steps to be taken in the case of a pollution spill. In the western part of Florida, the document lists seven discharge cleanup cooperatives or contractors available to respond rapidly to pollution incidents. Six organizations are located in the southern part of Florida.

USGS has the authority to approve all Offshore Operator's Oil Spill Contingency Plans and Plans of Exploration and Development for lease areas which must address cleanup equipment and response time capabilities; therefore, to meet USGS requirements, Clean Gulf Associates, an organization of member Offshore Operators, was formed and a cooperative Emergency Action Plan for combatting oil spills was formulated. At present, two CGA bases in Florida, one in Bradenton and the other in Panama City, are not operative. The offshore industry operating in Florida is retaining cleanup equipment on work boats and on some offshore exploration platforms. Fast response equipment located in Venice, Louisiana (skimmers, outriggers, floating oil booms, pumps, and storage tanks), has a capability of being 100 miles offshore within 12 hours of notification of a spill, but in the case of Florida, the first response equipment is considered essentially on scene. In the eventuality increased petroleum development occurs off the coast of Florida, the offshore industry (CGA) has stated that they would develop additional CGA bases, as well as maintain the two bases already established in Florida to meet USGS Order No. 7 (DEIS for Sales 67 and 69, Section I.C.3.b. and c.(2)).

15-4 This EIS described the potential impacts resulting from oil and gas lease Sales 67 and 69. Expected impacts from these proposed lease sales on the Gulf coast of northwest Florida have been addressed as specifically as possible at this time.

15-5 If any of the tracts listed in this EIS should yield producing oil and/or gas wells, it is suggested that you contact the Florida OCS representative at the Governor's Office in Tallahassee, Florida, for information regarding protection or preservation of environmental quality in your area of interest.

State of Florida

Department of Natural Resources Interoffice Memorandum

DATE: 20 April 1981

TO: Walt Kolb

FROM: Karen Steidinger KAS

SUBJECT: DEIS for OCS Lease Sales 67 and 69

My main concern with the DEIS for OCS lease sales 67 and 69, as in other OCS drilling activities, regards calculations on probabilities of oil spills contacting land - particularly for tracts off central and southwest Florida.

16-1 I do not feel that Loop Current entrainment has been dealt with adequately. Transport of surface material from offshore southwest Florida to inshore areas and to the Florida east coast is common. For example, drift bottles were released monthly at Hourglass stations from 1965 - 1967; 27% of the returns were retrieved from inshore southwest Florida and 60% of returns were retrieved from the Florida east coast (see attached). Transport from the west coast to the east coast can occur in less than two weeks. Also attached are summary figures showing the position of the Loop Current from 1975 through part of 1980; its position is variable seasonally. Table 7 shows that the Loop Current intrudes on the West Florida Shelf at least [redacted] 25% of the year.

These drift bottle and Loop Current intrusion data, along with red tide occurrence and transport data, suggest that if an oil spill were to occur on the south West Florida Shelf, it could easily impact Florida. This should be a serious concern since Florida has sensitive mangrove, seagrass, and coral habitats as well as productive shrimp, lobster, stone crab, and finfish fisheries grounds in the areas of potential impact. Offshore cleanup of oil spills should be actively researched for retainment and disposal.

KAS:gn
Attachments

cc: Dr. Elton J. Gissendanner
Edwin A. Joyce, Jr.
Charles R. Futch
Debby Blizzard

areas. This indicated that water on the continental shelf near Panama City is probably influenced by the Loop Current, a dominant offshore current. Ichiye et al. (1973), reporting on Gaul and Boykin's (1964-1965) drift bottle data from releases 60-150 miles off the northeast Gulf coast, stated that there were distinct seasonal trajectory patterns. In late summer and early fall a high percentage of returns were from the western Gulf, while at other times bottles were transported southward. Chew's (1955a) research on red tide off Florida's west coast suggested that water on the continental shelf was affected by a cyclonic eddy driven by the Loop Current. Chew (1955a) also indicated two eddies driven by this current; one extending from Mississippi to Panama City, and the other off Tampa Bay extending outward to the 100-fathom line (183 m).

Other researchers in the area have utilized hydrographic sampling techniques to determine current structure. Among these studies are those by Nowlin et al. (1968), Leipper (1970), Austin (1971), Maul (1975), and multi-institutional sponsored projects such as EGMEX (Rinkel, 1971), ESCAROSA (Rinkel and Jones, 1973), and MAFLA (SUSIO, 1975). All of these studies point to a highly dynamic multiple eddy system over the West Florida Shelf which is at times influenced by a strong, anticyclonic, offshore current, the Loop Current.

ACKNOWLEDGMENTS

Any project as complex as Hourglass requires the cooperation of many individuals to whom we are indebted. Special thanks are due to Dr. E. Kenneth Gray for his assistance with data recording, and Lucinda Grant for her patience in typing all of the graphic presentations. Sincere gratitude is extended to Mrs. Gay B. White for her many hours of meticulous work recording data, distance computation, and editorial assistance. We are especially grateful to Mr. M. O. Rinkel (SUSIO), Dr. George A. Maul (NOAA/AOML) and Mr. John Brucks (NOAA/NMFS) for their guidance and suggestions concerning this paper. The editorial assistance of Mr. E. A. Joyce, Jr., Director, Division of Marine Resources, Mr. Dale S. Beaumariage, Chief, Bureau of Marine Science and Technology, Ms. Karen A. Steidinger (FDNR/MRL) and Ms. Terry Cone (FDNR/MRL) is greatly appreciated.

METHODS AND MATERIALS

Drift bottles used in this study were eight-oz., (236 ml), clear glass bottles containing a self-addressed, postage-paid card, imprinted in English and Spanish (Figure 2), requesting the finder to complete pertinent information and return the card to the laboratory. Cards were serially numbered for identification and placed in bottles so that the instructions, "Break This Bottle," were visible. This lessened the chance of damaging the card and possibly destroying the identification number if the finder attempted to remove the card without first breaking the bottle. The bottles were not ballasted and were sealed with a cork. Although no reward was offered, a form letter was sent thanking respondents for their assistance.

Drift bottle data were catalogued according to station, bottle number, recovery date, area, locality, coordinates, days adrift, and nautical miles/24 hrs (nmi/day) (Appendix I). A Minerva Map Measure was used to calculate nautical miles travelled. Distance was determined by following the most probable direct water route.

Coastlines where bottles were recovered have been divided into five areas (Figure 45. See pages 33 to 69) to record the number of bottles recovered from each station in a particular area. Area I extends from latitude 28° N southward along the Florida coast to Cape Sable. Area II includes the Florida coastline north of Area I to just west of Cape San Blas. Area III extends westward from Cape San Blas, Florida, to the Mississippi Delta. Area IV is the Texas and remaining Louisiana coastline. Area V includes the Florida Keys and the entire east coast of Florida. The percentage of return was calculated for each Herman Cortez (HC) cruise in the Hourglass Program and for each area (Tables 2 and 3). Bottles recovered outside of these designated areas were not included in the area totals but are recorded under "others" in all pertinent tables.

TABLE 2. PERCENT RETURNS BY CRUISE

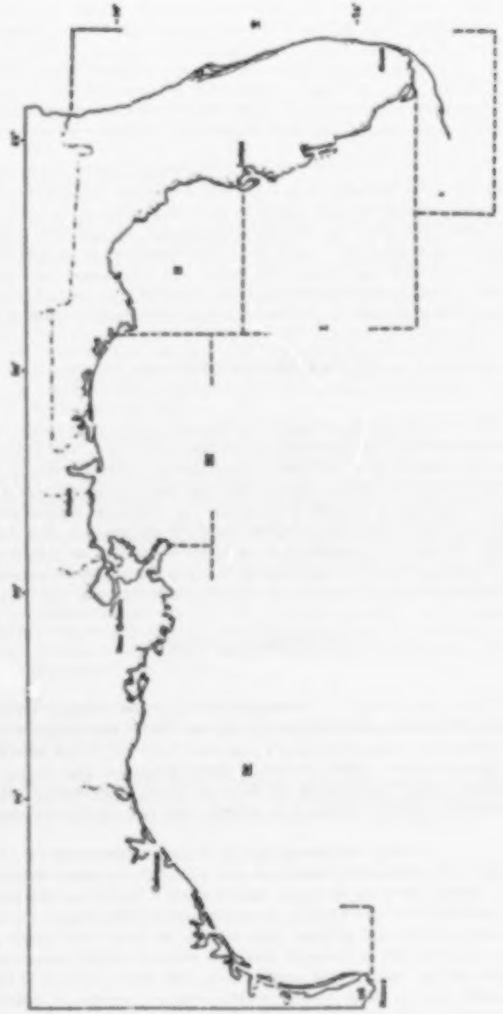
HC NO.	RETURNS	%	HC NO.	RETURNS	%	HC NO.	RETURNS	%
18	25	15.63	28	50	31.25	37	58	36.25
19	33	20.63	29	57	35.63	38	57	35.63
20	45	28.13	30	50	31.25	39	79	49.38
21	47	29.38	31	45	28.13	40	77	48.13
22	57	35.63	32	28	17.50	41	77	48.13
23	35	21.88	33	42	26.25	42	60	37.50
24	39	24.38	34	47	29.38	43	51	31.88
25	43	28.67	35	38	25.34	44	54	33.75
26	56	35.00	36	63	39.38	45	42	26.25
27	60	37.50						

Total Returns – 1415
% Returns – 31.73

TABLE 3. SUMMARY OF RETURNS BY AREA

	I	II	III	IV	V	OTHER
1965	16	0	1	36	145	N-1 M-8
1966	165	16	19	25	323	N-2 C-1 M-1
1967	196	27	1	44	380	N-5 M-3
Total	377	43	21	105	848	21
% Returns	26.64	3.04	1.48	7.42	59.93	1.48

N – North
M – Mexico
C – Cuba



D. Wallace, 1980 unpubl.

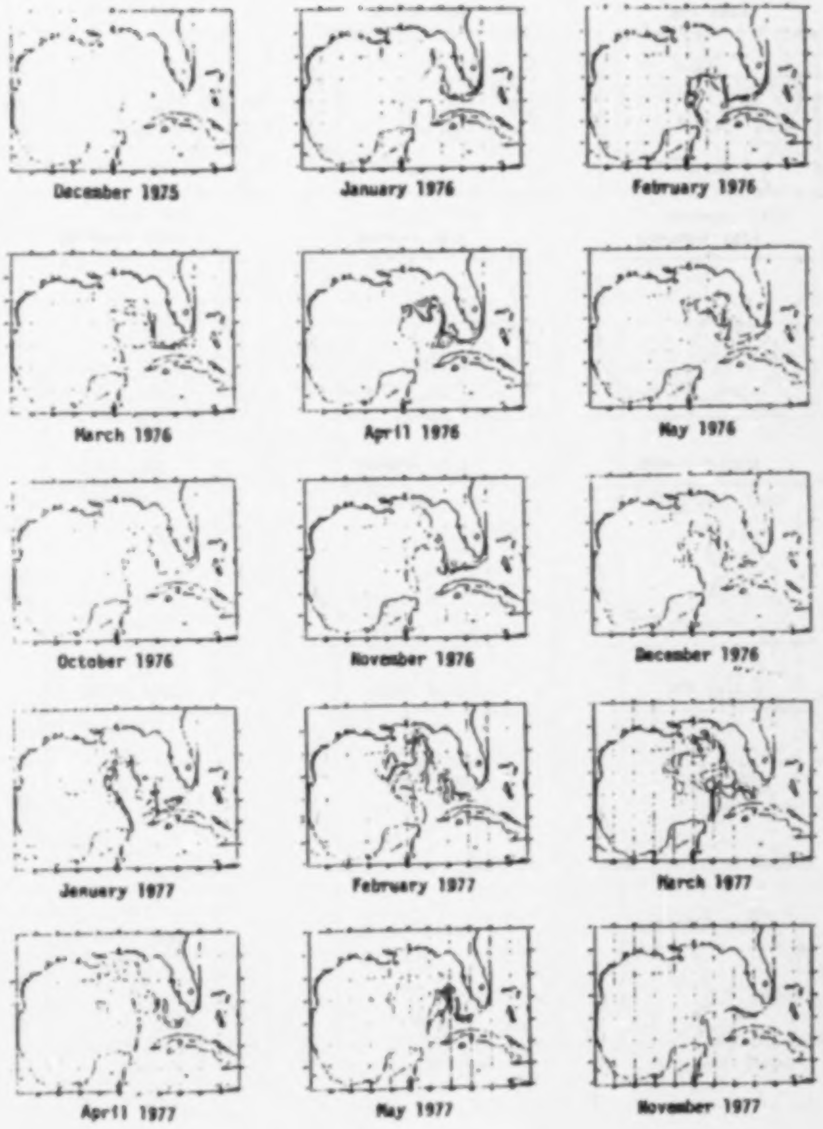
22°16'N, longitude 94°49'W. During the first three weeks of May, buoy no. 2607 again travelled north reaching a position of 78 nautical miles east of Corpus Christi on 21 May 1980. The maximum distance travelled for buoy no. 2607 was 43 nautical miles in a 24 hour period (a speed of 1.8 knots) while the minimum distance for one day was 3 nautical miles (a speed of 0.1 knots).

C. Satellite Observations of the Loop Current, December 1975-September 1980

Temperature measurements can be made from satellite to determine the location of the Loop Current for the months of January-June and October-December. During July-September the surface waters of the Gulf are generally homogeneous with the warmer Loop Current waters. Figures 10, 11 and 12 show the locations and configurations of the Loop Current for those months that data was available from December 1975-September 1980. The data was made available by the NOAA Laboratory in Miami. Also in the earlier years eddies from the Loop Current moving into the western Gulf were not plotted. Attempts were made to treat the data contuined in the figures statistically without success and collaboration with wind speed and direction was tried and no meaningful trend was observed.

The meandering of the whole Loop could be as great as 100 nautical miles in a few days in relationship to a given geographical location in any direction; while the net change for a month might be nil. No attempt at determining a frequency of occurrence for eddy break-off was made since it could not be assumed that all eddies had been detected and plotted.

The Loop Current data for January-April 1980 was compared to movement of the TIROS buoys in the western Gulf. During December 1979 and January 1980 the Loop Current was extremely tilted towards the west and then moved eastward onto the west Florida Shelf in March and April 1980. Corresponding movements of the buoys could not be established. However, eddies were continually breaking off and drifting westward. The eddies are rarely observed longer than a week after release from the Loop Current. It is not known whether the entire eddy mixes vertically and loses its identity or whether only the surface waters mix with the surrounding waters and cannot be seen from satellite. If the eddies maintained themselves for long periods of time, they possibly could have affected the movement of the buoys.



December 1975 · January 1976 · February 1976

March 1976 · April 1976 · May 1976

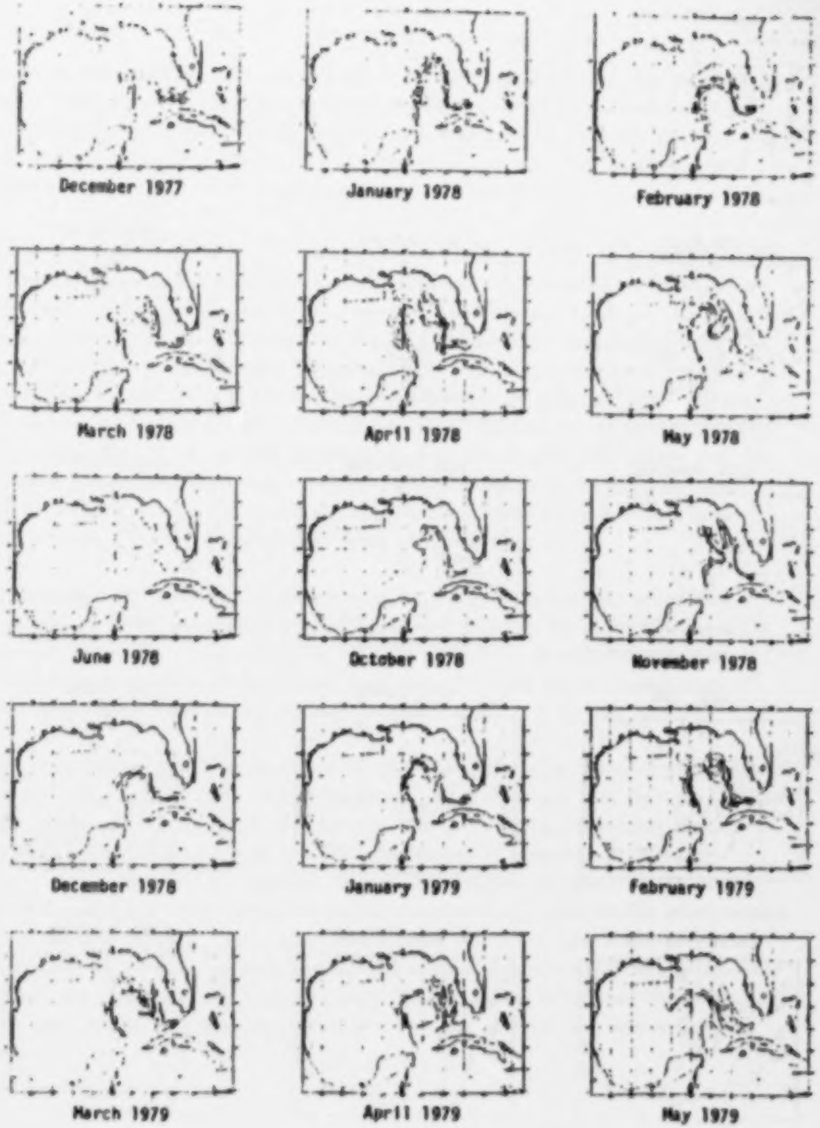
October 1976 · November 1976 · December 1976

January 1977 · February 1977 · March 1977

April 1977 · May 1977 · November 1977

Figure 10. Monthly Loop Current positions based on satellite imagery for the periods December 1975-May 1976, October 1976-May 1977, and November 1977.

Figure 11. Monthly Loop Current positions based on satellite imagery for the periods December 1977-June 1978 and October 1978-May 1979.



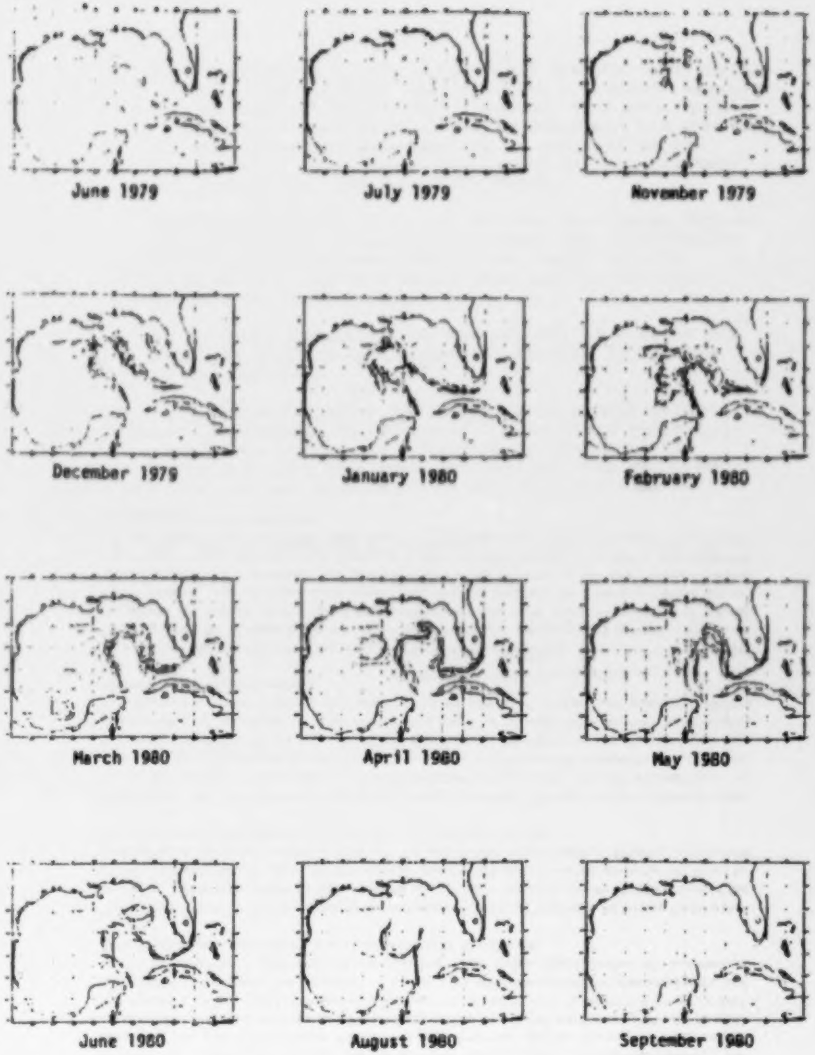
December 1977 January 1978 February 1978

March 1978 April 1978 May 1978

June 1978 October 1978 November 1978

December 1978 January 1979 February 1979

March 1979 April 1979 May 1979



June 1979
July 1979
November 1979
December 1979
January 1980
February 1980
March 1980
April 1980
May 1980
June 1980
August 1980
September 1980

Figure 12. Monthly Loop Current positions based on satellite imagery for the periods June-July 1979, November 1979-June 1980, and August-September 1980.

Table 7

Average Percent of Days of Loop Intrusion on the West Florida Shelf During the Period from December 1975 - September 1980

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Oct.	Nov.	Dec.
1976	7	14	21	44	14	*	*	4	12	6
1977	2	24	15	52	52	*	*	*	7	16
1978	43	44	43	34	42	*	*	50	63	5
1979	2	22	44	51	8	0	0	*	38	0
1980	2	8	4	49	35	0	*			
MEAN	11.2	22.4	25.4	46.0	30.2	0	0	27.0	30.0	6.8

*Loop not discernable by satellite visual imagery during these periods and during the months of August and September.

16-1 Loop Current entrainment, although not addressed directly in the Oil Spill Risk Analysis (Appendix D of the DEIS), is dealt with implicitly. The Oil Spill Risk Analysis model is divided into two major sections. The first part of the analysis deals strictly with trajectory analysis. These numbers are termed conditional probabilities and expresses the probabilities that an oil spill starting at a particular location will contact a certain target. The second major portion of the analysis is termed the overall or joint probabilities and expresses the probability of one or more spills, the most likely number of spills, and the expected number of spills occurring and contacting certain targets. These numbers take into account factors such as resource estimates, historic occurrences of oil spills, etc.

The trajectory analysis is that portion of the risk analysis that deals implicitly with Loop Current phenomenon. This is done simply by representation of currents in the study area on the grid system of the model. This arrangement allows for the seasoned changes but not for random perturbation. Then, by examining the trajectory analysis dealing with the appropriate target (Straits of Florida), we can have some realization of the effects of the Loop Current on probable oil spills.

Realizing that the data/information sources you listed in your letter may not have been utilized as a data set for this analysis, we have made much effort to incorporate applicable data and information in our data base. We will continue to imporve our data base as new information is available to us; however, it is also realized that at this time, all existing data is simply inadequate to state that we have a firm understanding of the effects of ocean currents and winds on oil spills. BLM proposes several studies over the next 3-5 years to alleviate this problem and will continue to improve and update our model as the information becomes available.

In regard to offshore cleanup of oil spills, USGS Order No. 7 discussed in Section I.C.3.c.(2) of the DEIS, requires the offshore industry to develop provisions for retainment and disposal of spilled oil. At present the disposal of retained oil is determined according to its weathered condition. If it is not very weathered, it is taken back to an operational petroleum platform and cleaned by running through the separators. If it is weathered, the oil is taken ashore and deposited in allocated disposal locations. The Florida Coastal Pollutant Spill Contingency Plan (available through your office) lists designated oil spill disposal sites. For a fuller discussion of oil spill cleanup and containment capabilities in Florida, see our response to Comment 19-1.

STATE OF FLORIDA DEPARTMENT OF COMMERCE
Division of Economic Development Collins Building, Tallahassee 32301

April 17, 1981

RECEIVED
APR 20 [illegible]

Mr. Walt Kolb
Intergovernmental Coordination
State Planning and Development
Clearinghouse
Office of the Governor
The Capitol
Tallahassee, Florida 32301

Dear Mr. Kolb:

At your request, a review of the draft Environmental Impact Statement (EIS) for O.C.S. Lease Sales 67 and 69 (SAI 81-1268E) was conducted. The following are areas in which we feel additional comments should be made in the final EIS:

17-1

1. We suggest that the final EIS for Lease Sales 67 and 69 contain a more thorough discussion of the socio-economic characteristics of the affected area of Florida than does the draft EIS. For example, the section devoted to tourism in the draft EIS contains very little Florida data (pages 97 and 98). Due to the major impact of tourism on the Florida economy, a more detailed discussion is warranted. Also, in the discussion of port facilities (pages 90 and 91), no reference to any Florida gulf ports was made despite the fact in 1979 $2.2 billion worth of products were shipped through Florida gulf ports.

17-2

2. A more detailed presentation of potential benefits to Florida from these lease sales should appear in the final EIS. The draft EIS states that (page 134):

   a. "Estimated O.C.S. activities occuring in the Florida Shelf offshore development area are expected to require one to four service bases." Port Manatee and Port Tampa are listed as possible sites.

and

Mr. Walt Kolb
Page Two
April 17, 1981

17-2

   b. "Cumulative impact assumptions include contribution to a new pipeline landfall with a probable location in Manatee County (Port Manatee) with additional possible locations in Hillsborough and Lee Counties and potential construction of expanded or new terminal and storage facilities at Port Manatee, Port Tampa, and Port Boca Grand."

   Even though these plans are subject to a large degree of uncertainty, an analysis of what the construction and expansion of these facilities would mean to Florida commerce as a whole (not just an estimate of jobs created) is needed.

17-3

3. An in-depth discussion of the effects of a major oil spill on tourism and commercial fishing in Florida is also needed.

We have observed similar deficiencies in past Environmental Impact Statements for proposed O.C.S. lease sales. The above areas should receive attention in the final EIS so that Floridians will have more information with which to acertain the risks and advantages of O.C.S. activities off their shores.

We hope these comments are helpful.

Sincerely,

Wynnelle Wilson

Wynnelle Wilson
Economic Analysis Supervisor

WW:pfw

cc: Dr. Leonard Elzie

17-1 Thank you for your comment. The FEIS includes additional information on port facilities and tourism along the Florida Gulf coast in Sections III.C.4. and III.C.7., respectively.

17-2 The estimated onshore facility requirements are discussed in Section IV.C.3. of the EIS. This information can be used to further elucidate the impact of such requirements on the Florida Gulf coast economies as a whole. For example, additional service base facilities in Florida could require up to 10 acres of land, and the expansion or construction of marine terminal and storage facilities may require about 40 acres. It can be assumed that on the basis of market land values, this will represent a higher use of the lands with concurrent increases to the landowners and associated tax revenues. However, there may also be some costs which are not reflected in the market value increase, e.g., loss of wetlands which would reduce the estimated economic benefit by some amount. The data necessary to determine these values is currently unavailable, particularly the monetary quantification of environmental losses.

Also, the information on population impacts presented in Section IV.C.4. of the EIS can be further used to describe the degree of economic impact in Florida. For example, in 1986 (which represents the peak year of employment impact) there would be 800 new residents in the Upper Gulf, which includes Mississippi and Alabama, and 1,630 new residents in areas adjacent to the Florida Shelf. It can be assumed that the per capita personal income of these new residents will be at least as great as that for the entire Gulf region in 1978 ($7,700), which is provided in Section III.C.1.b. of the EIS. Thus, the impact of proposed Sales 67 and 69 can be expected to increase personal income by $6.2 million and $12.6 million in the Upper Gulf and Florida Shelf areas, respectively, in the peak year and in 1978 dollars. Also, the employment resulting from these sales to existing residents in these areas will also provide some significant economic benefit in terms of increased personal income. A certain proportion of the work force which is currently underemployed in the area will receive jobs as a result of these sales. The data necessary to determine these values is currently unavailable. The total increased personal income in the study area will also generate additional tax revenues to the state of Florida, as well as to individual localities.

17-3 As discussed in Appendices B and D of the DEIS, the oil spill model results indicate that the chance of an oil spill associated with proposed Sales 67 and 69 conflicting with Florida tourism and commercial fishing activities is extremely low. Furthermore, the risk of significant adverse impact given such an interaction is also expected to be negligible. These conclusions are based on experiences from past oil spills and the results of the USGS oil spill model, as well as the availability of procedures which would adequately prevent or mitigate any significant adverse impacts. Thus, a more in-depth discussion of these effects does not seem warranted.

MANASOTA - 88

A Project for Environmental Quality 1968 - 1988

May 8, 1981

Manager, New Orleans OSC Office
Bureau of Land Management
Hale Boggs Federal Building
500 Camp Street, Suite 841
New Orleans, La. 70130

Re: DEIS for proposed OCS Lease
Sales 67 & 69

Dear Sir:

The potential production of oil and gas as a result of the OCS sale as described in Section I.C.I. is listed as 50.56 million barrels of oil and 912.57 billion cubic feet of gas (mean resource estimate) for Sale 67 and 26.63 million barrels of oil and 614.06 billion cubic feet of gas (mean resource estimate) for Sale 69 or a total of 77.19 million barrels of oil and 1526.63 billion cubic feet of gas.

At the present rate of U.S. consumption of approximately 15 million barrels a day of oil, this sale would supply (using the mean reserve estimate) the country with oil for a little over 5 days and at the present U.S. rate of natural gas consumption of approximately 20 trillion cubic feet a year this sale would supply (using the mean resource estimate) the U.S. with gas for approximately 30 days.

18-1 If Alternative B-1 were elected by the Department, this alternative would delete all of the 126 tracts near biologically sensitive areas and would reduce essential oil reserves (mean resource estimate) by 32% or approximately 1½ days of oil supply for the U.S. and would reduce estimated gas reserves by 13% of approximately 4 days supply.

In other words by delaying the sale of these 126 tracts, we would be temporarily eliminating 1½ days worth of oil supply for the country and approximately 4 days worth of gas for the country.

These tracts would remain as a potential strategic reserve of 2 critical, non-renewable resrouces - oil and gas.

Additionally, holding the proposed sale at a future date would postpone the possibility of any possible adverse impacts until the following issues are resolved:

18-2 (1) The cost of the probable degradation and possible destruction of biologically sensitive areas through cumulative impacts of small oil spills, possible large oil spills, construction of pipes to shore, possible expansion of port and offshore facilities, adverse impacts on endangered species, possible loss of coastal and marsh birds, a loss of marine biota and overall adverse impacts on 2 of the most productive estaurine areas (Port Manatee area and Port

18-2 Charlotte) in Florida as opposed to the value of 1½ days worth of U.S. oil supply and approximately 4 days worth of natural gas for the country. (It should be noted that the Charlotte Harbor area is of such great value to the state that Governor Graham appointed a Charlotte Harbor Committee in 1979 to study how best to protect the natural resources of the Charlotte Harbor area and study results may result in the committee recommending the region be declared an "area of critical state concern".)

(2) The value of waiting to develop these critical, non-renewable natural resources until a national policy is developed for their utilization and waiting until less environmentally damaging methods are developed for their production.

18-3 Further, although some scientists believe low-level oil pollution is potentially more dangerous to the ecosystem than dramatic large spills, the question of whether low-level chronic oil input or catastrophic spills are the most harmful has not even been determined. Yet, the draft EIS discounts the adverse impacts or low-level oil pollution that could be caused by these sales.

18-4 The fact that the Central Gulf of Mexico platform study on the effects of offshore petroleum studies in the La. area found the area contaminated with low-level, multi-source hydrocarbons has been ignored in projecting possible adverse impacts in the 67 and 69 sale area.

18-5 Inadequate consideration is given to adverse impacts associated with the sale areas caused by burying pipelines (i.e. resuspension of years of accumulations of toxic heavy metals, pesticides, organic matter, phosphates and other nutrients).

18-6 No consideration seems to have been given to the possibility that Port Manatee may be unable to expand its present operation to provide projected support and possible processing operations and still meet the requirements of the Clean Air Act.

18-7 No consideration seems to have been given to the extent that oil spillage prior to construction of necessary pipelines will occur and the adverse impact it will have upon threatened and endangered species.

18-8 The fact that Table E-2 indicates that replacing OCS production with imported oil will result in less risk from an oil spill seems to have been all but ignored.

18-9 Nothing in the draft EIS identifies the specific location or addresses the impacts of a proposed gas processing plant on the Tampa Bay area.

18-10 Based on the many issues not adequately addressed or understood at this time, members of Manasota-88 recommend the selection of Alternative B-1.

Sincerely,

Gloria C. Rains
Chairman

c: Elizabeth A. Hodecker
Reply: 5314 Bay State Rd.
Palmetto, Fl 33561

18-1 There are several assumptions regarding the impacts of Alternative B-1 which should be further explained. First, if this alternative was selected by the Department, one cannot conclude that the offering of these tracts will be merely delayed. In assessing the impacts of deleting the biologically sensitive tracts, you must assume that they will not be offered in the foreseeable future. Second, the loss from deleting these tracts relative to their lease sale would not be the elimination of 1½ days worth of oil supply and 4 days of gas supply for the U.S., but would be the difference in cost the U.S. must pay by substituting imported oil for these resources. Again, this loss cannot be considered temporary, but must be based on no future leasing of these tracts, at least as Alternative B-1 is intended. Finally, if these tracts are withdrawn from the sales, they cannot be considered potential strategic reserves of oil and gas. By definition the Strategic Petroleum Reserve (SPR) Program is designed to provide the U.S. with a margin of protection against such occurrences as the Arab oil embargo of 1973-1974. In order to accomplish this objective, a reserve supply of oil and gas available for immediate use is necessary. Thus, any unleased tracts cannot be considered part of that program regardless of the degree of confidence in their oil or gas productivity due to the time that would be required to lease, explore, and develop the tracts, which may be 2-10 years for tracts in proposed Sales 67 and 69. The status of potential reserves for inclusion in the SPR Program has little meaning in terms of the nation's need for an immediate supply of resources during a national emergency.

18-2 Thank you for your comment.

18-3 The DEIS did not mean to slight or discount the serious impact of chronic oil pollution. The discussion in Section IV.C.1.c. addresses this problem.

Clearly, the issue over the effect of low-level versus catastrophic spills seems to be supported from both sides. There are those who have studied the low-intensity, persistent introduction of hydrocarbons (natural seepage) over thousands of years and conclude that the ecosystem remains biologically active and should not be considered to have been irreparably harmed (Geyer and Giammona, 1980). There are others that argue that most ecosystems can tolerate some pollution because oil, a natural substance, can be dissipated or removed by processes such as evaporation, auto-oxidation, and biodegradation. It is important though that many believe that chronic low-level pollution is potentially more damaging to ecosystems than isolated, catastrophic spills. Most conclusive it seems is the fact that there is limited, but convincing, data that chronic levels of petroleum contamination in the aquatic environment may interfere with the normal physiological processes and behavioral responses of certain organisms. An excellent study summarizing this concern is "Petroleum Hydrocarbons in Aquatic Ecosystems — Behavior and Effects of Sublethal Concentrations" (Connell and Miller, 1980 and 1981). Their conclusions are those of this staff, and it was mentioned in Section IV.C.1.c., that is, little information is available and what is needed is more conclusive studies that have the following priority for research: long-term studies on a few spills; studies on the dynamics of systems where chronic contamination exists; and combined field and laboratory studies addressing the significance of sublethal effects.

The average lifetime of a producing well is 13 years; therefore, the offshore oil industry's presence in any one area is not permanent. The time frame or the concentrations that a system must be exposed to oil to have irreparable damage is presently unknown. Luckily, stop the chronic release of oil, and the ecology will return to normal. The National Academy of Sciences (1975) concludes that there is no evidence of food chain magnification of petroleum hydrocarbons in marine organisms. The rate of recovery depends on the type and amount of oil and on the energy needed to drive the complex series of physical, chemical, biological, and geological processes that disperse and degrade petroleum.

One important point in this discussion is that the task of BLM's Environmental Assessment Division is to assess the impacts caused by Sales 67 and 69. It has been determined that the worldwide input of oil to the ocean from offshore drilling and production operations is less than 5% of the total petroleum input in the oceans. To fulfill the energy needs of this country, the potential oil resources that would be exploited by Sales 67 and 69 would simply be tankered into this country.

Chronic marine pollution by petroleum is an almost inevitable consequence of the dependence of a rapidly growing population on oil-based technology. Reduction is a question of national consciousness; not having this sale would not cause a significant reduction.

18-4 It is realized that the DEIS for Sales 67 and 69 does not make an attempt to evaluate or compare the hydrocarbon results of its environmental studies. Although this may seem a shortcoming of our environmental assessment, it is not that the need to address this issue is not considered important, rather the strategy taken to compare the scattered Gulf-wide studies must be approached carefully. The mentioned Central Gulf of Mexico Platform Study has, in fact, not submitted their final report, and they will compare their final conclusions with hydrocarbon concentration results of other studies. Of particular concern is the fact that analytical methodologies used to determine hydrocarbon concentrations have varied so much among research over the past 10 years. New state-of-the-art methodology allows a sophistication of detection not possible until very recently. The capability to identify more components at lower concentrations is continually improving. Aromatic components, an indicator of petroleum contamination, is not easily examined without gas chromatography/mass spectrometry techniques, which were not used until the most recent research. Therefore, comparisons among studies examining different locations are difficult.

Before the determination of possible adverse impacts caused by the presence of low-level, multisource hydrocarbons in the central Gulf of Mexico can be addressed, these results must be compared to sediment hydrocarbon concentrations in other areas. The degree of influence from probable inputs, including natural seepage, the Mississippi River discharge, the density of petroleum platforms, and tankering routes, should be determined. The hydrocarbon concentrations should be compared to known biological effects in the range of concentrations measured. The present level of scientific knowledge makes it difficult to predict the complete chemical behavior of sediment hydrocarbons.

It is the sincere hope of the Environmental Assessment Division of BLM's New Orleans OCS Office that, by the writing of the next EIS, effort towards completing some or all of these above criteria will be substantial enough that this issue of concern can be addressed properly.

18-5 Our analysis indicates that no more than one pipeline landfall along the Florida coast is expected as a result of the proposed sales. Should this pipeline be justified by offshore finds of petroleum, it must be permitted in OCS waters by BLM and in state waters by the U.S. Army Corps of Engineers and appropriate state agencies. Information obtained during BLM-funded studies off Florida indicates that the offshore sediments are essentially "pristine," although sediments of busy ports and harbors and nearshore areas may be polluted to various degrees. Should the pipeline route eventually planned cross through polluted or otherwise sensitive areas, an EIS may be required (by the COE), and appropriate mitigating measures, including alternative routes, will be considered. Even if the route should be through a badly polluted nearshore area or bay, effects of resuspension due to pipeline emplacement and burial are expected to be localized (turbidity and suspended pollutants significant only within a few hundred to a few thousand meters) and ephemeral (turbidity and suspended pollutants would be dispersed within a few days or weeks following completion of pipe-laying activities) so that no long-term impacts would result.

18-6 In the discussion of service base requirements, it is mentioned that the "Port of Tampa could also provide potential locations for such facilities" (p. 134 of the DEIS). It is assumed that use of either location for service base facilities would be contingent on meeting the requirements of the Clean Air Act and that such facilities could be developed/operated meeting Clean Air Act requirements. No processing operations are anticipated to be located at Port Manatee.

18-7 Potential adverse impacts on threatened and endangered species from oil spills prior to the construction of pipelines, while not specifically discussed in the DEIS, are considered in the overall impact analysis pertaining to these species.

In general the impact analysis in the DEIS is based primarily on the oil spill risk analysis (OSRA) in Appendix D. The OSRA for this proposal is based on an estimated production of .085 billion barrels of crude oil (p. 267 of the DEIS) and that OCS production will be piped onshore, and assumes the following spill rates (updated):

Platforms	$2.05 \times 10^{-3}/10^6$	bbls produced	Gulf of Mexico
Pipelines	$1.82 \times 10^{-3}/10^6$	bbls piped	(worldwide data)
Tankers	$3.88 \times 10^{-3}/10^6$	bbls tankered	(worldwide data)

The worldwide spill rate for waterborne transport is about 69% higher than pipeline transport; however, it is believed that spill rates for waterborne transport of OCS production in the Gulf of Mexico would be lower than worldwide rates because of the shorter distances and smaller volumes. The OSRA makes the assumption that one-half of the tanker-related spills occur outside of the study area and, therefore, for foreign oil tanker routes, applies a rate of $1.94 \times 10^{-3}/10^6$ spills per bbls tankered. Based on the crude oil estimate of .085 bil bbls, the expected number of resulting if pipeline transportation were used is 0.33 (.085 x 3.87 bbls produced and piped), the expected number of spills resulting if waterborne transportation were used is 0.50 (.085 x 5.92 bbls produced and tankered), an increase of about 0.17 spills which is not a very large increase over pipeline transportation.

Currently about 14 mil bbls of petroleum products are shipped into Port Manatee annually without any apparent adverse impacts to threatened and endangered species in that region. Also, 27 years of OCS oil and gas production in the Gulf of Mexico and the biological opinions of FWS and NMFS (Appendix E of the DEIS) indicate the proposal is not likely to jeopardize the continued existence of threatened and endangered species of their habitat in the Gulf of Mexico region.

18-8 Table E-2 cannot be interpreted in this manner since the only way to consider the decrease in volume is by interpreting the results of Tables E-1 and E-2 side by side. If we compare the figures in Tables E-1 and E-2 under the columns headed "1990-1999," we find that the risk of oil spill is actually higher when we replace OCS production with tankered imports.

18-9 No gas processing facilities are required for the Florida Shelf offshore development area due to the minimal gas resources estimated for the area (Table IV-9, p. 135 of the DEIS).

18-10 Thank you for your comment. Your recommendation concerning Alternative B-1 is noted and will be considered.

Southwest Florida Regional Planning Council

2121 West First Street, Fort Myers, Florida 33901 (813) 334-7382

RECEIVED
APR 30 1981

Ms. Elizabeth Hodecker
Office of Planning and Budgeting
Office of the Governor
The Capitol
Tallahassee, FL 32301

April 28, 1981

Dear Elizabeth:

We have reviewed the draft "Environmental Impact Statement for Proposed OCS Oil and Gas Sales 67 and 69." Our comments are as follows:

19-1 1) On page 116 and elsewhere, the Statement indicates that the probability of a spill of over 1000 BBLs is now .99+. For this reason, assurances of timely arrival of the sophisticated spill equipment is necessary.

19-2 2) Pages 52, 64 and elsewhere indicate improved recreational fishing as an environmental benefit of some proportions. This would seem to be an "economic" benefit rather than environmental, since no claim is made to improve fish productivity or species diversity. The economic benefit may even seem to be only short term, since the rigs cannot be expected to stay beyond the life of their primary purpose.

19-3 3) Assumptions on page 138 indicate that oil and gas employment is 0 for Florida without leases 67 and 69. This seems to overlook existing oil operations in Florida and previous lease sales.

19-4 4) The EIS looks upon both the CEIP and CZM as mitigating measures for negative oil and gas impacts. With both the proposed Federal budget cuts and the possible dissolution of the State's CZM program, these mitigative measures may not be available, at least for Florida.

5) We note that the preponderance of lease areas are closer to Boca Grande than Port Manatee.

19-5 6) Finally, we recognize that to examine the future Gulf Coast in a few pages would mean our area's statistics are generally subsumed within the overall numbers. It should be noted that the overall positive impact of the project may have short run negative impacts for specific areas (such as ours) should an uncontrolled spill occur. Hence, the existence of a CEIP and an effective spill plan with the appropriate equipment is a necessary "insurance" program to prevent inequitable distribution of impacts.

Thank you for the opportunity to comment.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Wayne Daltry

Roland H. Eastwood
Executive Director

RHE/WED/cb

19-1 The Oil Spill Risk Analysis (Appendix D of the DEIS) is a computer model examining oil spillage marine trajectories. The analysis tells us that by examining all potential oil spillage trajectories (determined by historic rates of oil spillage and the oil driven by surface currents and winds) there is a 99% probability that there will be eight oil spills contacting land within 10 days resulting from both proposed and existing leases. It is noted that the model also determines that there is no chance of any of those spills (0%) hitting Florida's recreational beaches. Taking into account all the factors acting to dissipate the oil slick (Section IV.C.1.c.(2) of the DEIS), it will reduce the assumed environmental impact of these spills even more. The assurances of sufficient oil spill containment and cleanup response will, as you note, further improve the chances for reducing potential deleterious effects if an oil spill does occur.

Although the eastern OCS area is not, at present, a major location of petroleum exploration or development, the state of Florida has wisely anticipated the need for oil spill contingency planning. Florida oil containment provisions are extremely sufficient to provide rapid response to accidental petroleum discharges. The state of Florida has developed a Florida Coastal Pollutant Spill Contingency Plan to provide a coordinated response by state government agencies. This document is available through the Florida Department of Natural Resources and outlines the operational response and cleanup steps to be taken in the case of a pollution spill. In the western part of Florida, the document lists seven discharge cleanup cooperatives or contractors available to respond rapidly to pollution incidents. Six such organizations are located in the southern part of Florida.

USGS has the authority to approve all Offshore Operator's Oil Spill Contingency Plans and Plans of Exploration and Development for lease areas which must address cleanup equipment and response time capabilities; therefore, to meet USGS requirements, Clean Gulf Associates, an organization of member Offshore Operators, was formed and a cooperative Emergency Action Plan for combatting oil spills was formulated. At present, CGA bases in Florida, one in Bradenton and the other in Panama City, are not operative. The offshore industry operating in Florida is retaining cleanup equipment on work boats and on some offshore exploration platforms. Fast response equipment located in Venice, Louisiana (skimmers, outriggers, floating oil booms, pumps and storage tanks), has a capability of being 100 miles offshore within 12 hours of notification of a spill, but in the case of Florida, fast response equipment is considered essentially on scene. In the eventuality the increased petroleum development occurs off the coast of Florida, the offshore industry (CGA) has stated that they would develop additional CGA bases, as well as maintain the two bases already established in Florida to meet USGS Order No. 7 (Section IV.C.3.b. and c.(2) of the DEIS).

19-2 The improved recreational fishing afforded by oil and gas structures is primarily an economic and social benefit (p. 243 of the DEIS). The term environmental impacts, as used by NEPA, is all encompassing and includes social and economic as well as biological effects on natural resources. Page 167 of the DEIS supports your statement that benefits to fishermen resulting from the artificial reef effect of "rigs" are short term. You may be interested to know that BLM is cooperating with the National Marine Fisheries Service, the Gulf of Mexico Fishery Management Council, the offshore industry, and others in the evaluation of a program initiative aimed at retaining offshore, obsolete oil and gas structures valuable to fishing. The state of Florida has already accepted one obsolete structure from Exxon for use as an artificial reef.

19-3 According to 1977 data which was the latest information available from the U.S. Department of Commerce at the time of this analysis, there was no employment by place of residence for SIC Code 13 in Florida Shelf counties. This condition may be related to the fact that this data is not recent enough to reflect Sale 65 lease results. An examination of the latest data available at the time of this response (1979) still indicates no employment for SIC Code 13 in the Florida portion of the study area. Furthermore, the effect, if any, on the conclusions of the analysis of mistakenly excluding such employment would be negligible due to the probable smallness of direct oil and gas employment in Florida in 1981.

19-4 Thank you for your comment. The text has been changed to reflect the uncertainty of future funding for CZM programs.

19-5 We appreciate your concern that negative impacts might occur in your area as a result of offshore oil and gas activities. Although we can provide no assurance of continued existence of NOAA's Coastal Energy Impact Program, we can provide some assurance regarding effective oil spill response plans.

Each operator must submit an oil spill response contingency plan to USGS as a required part of the Plan of Exploration and of the later Plan of Development. No offshore drilling or production activities may occur until that plan is approved by USGS, and the plan must be reviewed annually. We are confident that USGS will not permit oil and gas activities offshore Florida if the required contingency plans do not provide sufficient assurances that oil spills which might occur will be dealt with in a timely and effective manner so as to avoid or minimize any negative impacts which might occur. In general, the operators base their plans on response capabilities of their own personnel and equipment and on the capabilities of Clean Gulf Associates. At present, Clean Gulf Associates maintains bases of gear and trained personnel at various locations along the Texas/Louisiana coast, as well as in Florida. These response capabilities are also backed up by the capabilities of the U.S. Coast Guard's Gulf Strike Team based in Bay St. Louis, Mississippi. Brief descriptions of capabilities, response times, base locations, etc., are included in Section I.C.3.

Southwest Florida Regional Planning Council

2121 West First Street, Fort Myers, Florida 33901 (813) 334-7382

RECEIVED
MAY 4 1981
Natural R[illegible] [illegible] Public
Safety [illegible]
Office of the [illegible]

Ms. Elizabeth Hodecker
Office of Planning and
  Budgeting
Office of the Governor
The Capitol
Tallahassee, FL 32301

April 30, 1981

Dear Ms. Hodecker:

The attached comments were received from the City of Cape Coral Planning Department. They address the Proposed OCS Oil and Gas Sales 67 and 69 (A-95 #81-120).

When we receive any other comments, they will be forwarded to you.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Jim Newton

James E. Newton II
Regional Planner

JEN/cgh

Attachment

CITY OF CAPE CORAL

PLANNING DEPARTMENT

RECEIVED
APR 28 [illegible]
S.W. FLORIDA REGIONAL PLANNING COUNCIL

April 27, 1981

Mr. Roland E. Eastwood
Executive Director
S.W. Florida Regional Planning
  Council
2121 W. First Street
Fort Myers, FL 33901

Dear Mr. Eastwood:

We take this opportunity to respond to your request for comments concerning the consistency of the Proposed Offshore Drilling activities with the Plans and Policies of the City of Cape Coral. Although we are not in the position to determine the technical environmental impacts of such activities, we are concerned about these impacts with regard to sensitive areas as described in the Environmental Element of the Cape Coral Comprehensive Plan.

20-1 This Element makes provisions for the preservation of areas such as Matlacha Pass, Glover Bight, Charlotte Harbor South, Fourmile Cove Eco-Park, and Shorehaven. Possible oil spills could have a significant impact on these environmentally sensitive areas.

We are concerned about the impacts of offshore oil drilling on the City of Cape Coral. Please keep us posted on further developments with regard to this matter.

Sincerely,

Michael Levin

Michael D. Levin
Principal Planner

ML:BAC

20-1 Cape Coral's environmental conservation and preservation areas and public parks are virtually unthreatened by proposed lease Sales 67 and 69. The results of the Oil Spill Risk Analysis (Appendix D of the DEIS) indicates the probability of a major oil spill impacting the Lee County shorefront is negligible.

81-120

POST OFFICE BOX 900 • CAPE CORAL, FLORIDA 33904 • TELEPHONE (813) 542-1444

A-95 #111-81; Draft EIS Proposed Outer Continental Shelf (OCS) Oil and Gas Sales 67 and 69. Texas, Louisiana, Upper Gulf and Florida

CLEARINGHOUSE REVIEW

The Department of Interior has requested review and comment on behalf of the Bureau of Land Management on the Draft EIS of the proposed Gulf of Mexico OCS Oil and Gas lease Sales 67 and 69 to be located 80 to 120 miles off the coast of the Tampa Bay Region. The supply port for these proposed drilling activities will be Port Manatee. The proposed activity will consist of leasing 2, 458, 827 acres (472 tracts) for oil and gas exploration and development. This draft EIS is an analysis of the potential and expected impacts proposed oil and gas exploration and development activities in the Gulf of Mexico on the human environment. Location: Alabama, Florida, Louisiana, Mississippi and Texas/ Population to benefit: U. S. Public/ Agency: DOI.

Local Comments Requested From:

Manatee County: No comment as of May 22, 1981.

Council Comments and Recommendations

21-1 This proposal has been reviewed for consistency with the Council's adopted growth policy, the Future of the Region. Since these drilling activities will take place 80 to 120 miles southwest of the coast of the Tampa Bay Region, none of the Council's regional policies will directly apply to these offshore activities. However, the onshore development of service and storage facilities connected with this project is consistent with Council policy that suitable industrial and business sites of sufficient size and location be planned to accommodate the desired rate of new industrial development. In addition, port facilities and waterways should be developed to assure an optimum balance between economic costs and benefits and environmental and social costs. Also, offshore transfer facilities should be fully explored and evaluated as potential alternative to major channel and harbor deepening projects.

Environmental concerns regarding offshore drilling center on the potential for oil spills. Although the possibility of oil spills is low, the potential damage is significant. The Council notes the following additional concerns:

21-2 1. The Council's proposed Coastal Energy Impact Program (CEIP) should be instituted as soon as possible to mitigate possible problems with offshore drilling.

21-3 2. It was noted during the review that 20 to 80 million gallons of water will be needed to support offshore drilling. This volume of water could have considerable impact on service ports such as Manatee.

21-4 3. Environmental Effects of the alternatives (Alternative Section p. 51 and chart on page 64) should be expanded to consider more areas of major concern such as beaches, coastal marshes, mangroves, recreation tourism, esthetics, commercial fishing and economy. Discussion of currents and winds should be accompanied by a graphic display depicting in some detail the season fluctuations of both currents and winds and also areas of strong local currents other than the loop current.

21-5 4. The draft EIS contained insufficient discussion of coastal birds, in light of the potential impact on their population and habitats.

21-6 5. Additional information is needed concerning leases that occur in "live bottom" areas of the Eastern Gulf. What stipulations are designed to protect these areas?

21-7 6. What impact will oil drilling have on phytoplankton and zooplankton near the slope?

21-8 7. The discussion of ports should include the Port of Tampa.

21-9 8. Commercial Fisheries Impacts addresses recreational fishing and not commercial fishing. Has commercial fishing successfully co-existed with petroleum development?

21-10 9. Because of the evidenced high propensity of oil spills by pipeline accidents, more detail of mitigative actions in the event of a spill should be addressed.

This project is regionally significant and several specific regional concerns have been identified during the review which should be addressed in the final EIS. Since Manatee County did not receive a copy of this draft EIS in a timely manner, their comments will be forwarded as soon as possible and should also be addressed in the final EIS.

Committee adopted May 26, 1981.

George C McGough for
Commissioner Jan Platt, Chairman
Clearinghouse Review Committee

Please note: Unless otherwise notified, action by Clearinghouse Review Committee is final. Append copy to application to indicate compliance with clearinghouse requirements. Comments constitute compliance with OMB Circular A-95 only.

cc: Walt Kolb

21-1 Thank you for your comment.

21-2 Institution of the suggested action must be initiated by your appropriate state office.

21-3 Thank you for your comment.

21-4 We believe that the environmental consequences of the alternatives, including the proposed action, have been adequately discussed in Sections II and IV and in Appendix B (Summary Impact Assessment) of the DEIS. A detailed graphic display of winds and currents has been provided on the Gulf of Mexico visuals for the FEIS for Sales A66 and 66, two copies of which will be sent to your office.

21-5 The discussion of potential impacts on coastal birds presented on pages 160-163 and 216-217 of the DEIS is based on an expected 0.37 oil spills occurring and a 0.19% probability that an oil spill will reach landfall within 30 days; minimal onshore construction is projected. Based on these factors the potential impacts to coastal bird species from this proposal is expected to be minimal, and for the purposes of this proposal, the discussion contained in the DEIS is adequate.

21-6 Stipulations for leases in potential live bottom areas are discussed in Section I.C.2.b.

21-7 Offshore drilling for oil and gas in any area will have very little impact on the plankton because: (1) the plankton are ubiquitous but patchy, (2) the plankton moves with the wind and currents, (3) any impact from discharges would be very localized and temporary in nature, and (4) recruitment from unaffected plankton would be rapid and complete. See also Sections III.B.1.a. and b., IV.C.2., and IV.D.1.a.

21-8 Thank you for your comment. The suggested change has been made.

21-9 The description of impacts on commercial fishing is contained in Appendix B (Summary Impact Assessment) of the DEIS. As shown therein, the expected loss to such activity as a result of the proposed sales would be low to negligible. Furthermore, Section III.C.5. states that commercial fisheries resources in the northwestern Gulf of Mexico have coexisted with petroleum development for over 30 years. A discussion related to this conclusion is also provided in that section of the EIS.

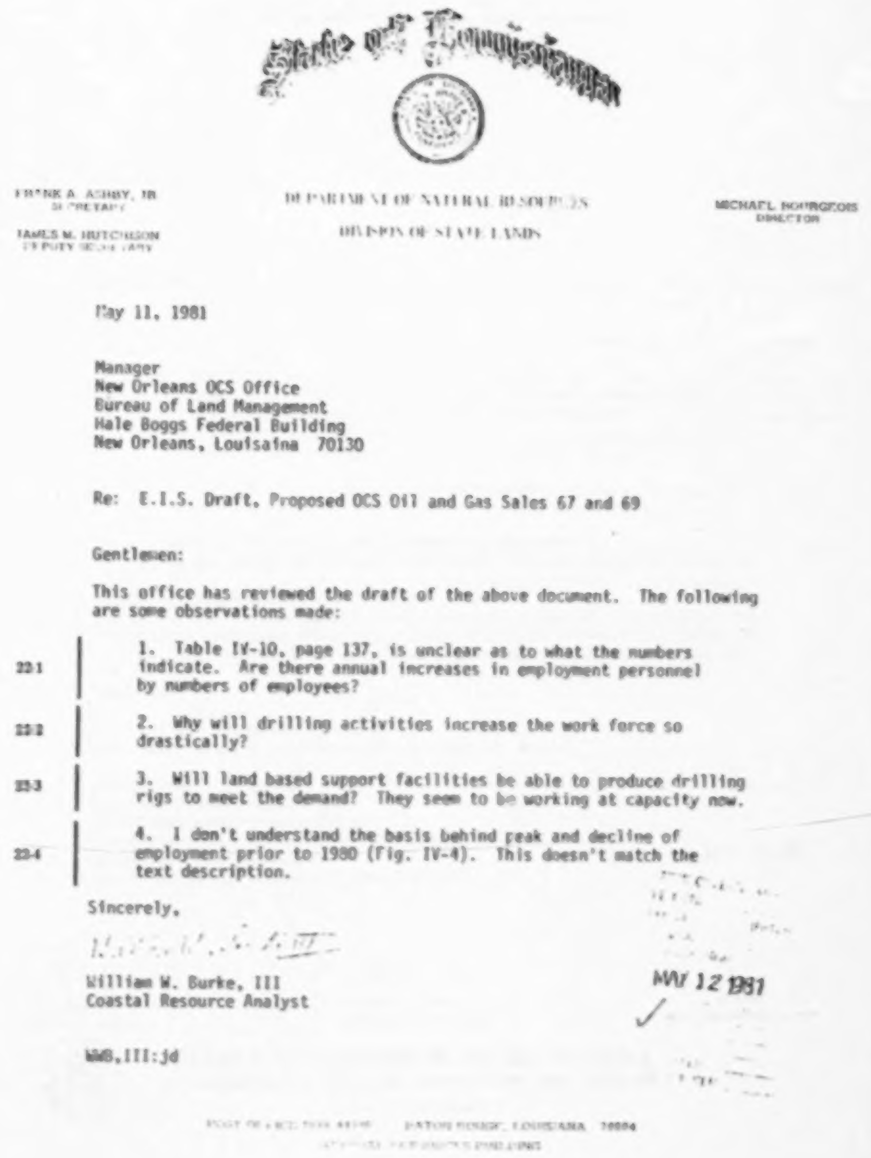
21-10 Spillage rates recently recalculated by our staff, based on USGS data for oil spills greater than 1,000 barrels for the years 1964-1979, are:

(1) spills occurring at platforms - 2.05 spills per billion barrels of oil produced;

(2) spills resulting from tanker operations - 3.87 spills per billion barrels of oil shipped; and

(3) spills resulting from pipeline operations - 1.82 spills per billion barrels transported.

As you can see, the risk of a spill from pipeline operations is only half that of the risk from tankering. In any event, however, the mitigative actions taken in the event of a pipeline spill are substantively the same as those from other sources of spills and include: (1) avoidance of spills, (2) containment and clean-up of spills which occur, and (3) mitigation of damages. These actions are discussed in Section I.C.3. of the EIS.



State of Louisiana

FRANK A. ASHBY, JR.
SECRETARY

JAMES M. HUTCHINSON
DEPUTY SECRETARY

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF STATE LANDS

MICHAEL BOURGEOIS
DIRECTOR

May 11, 1981

Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
New Orleans, Louisaina 70130

Re: E.I.S. Draft, Proposed OCS Oil and Gas Sales 67 and 69

Gentlemen:

This office has reviewed the draft of the above document. The following are some observations made:

22-1 1. Table IV-10, page 137, is unclear as to what the numbers indicate. Are there annual increases in employment personnel by numbers of employees?

22-2 2. Why will drilling activities increase the work force so drastically?

22-3 3. Will land based support facilities be able to produce drilling rigs to meet the demand? They seem to be working at capacity now.

22-4 4. I don't understand the basis behind peak and decline of employment prior to 1980 (Fig. IV-4). This doesn't match the text description.

Sincerely,

William W. Burke, III
Coastal Resource Analyst

WWB,III:jd

MAY 12 1981

[illegible] BATON ROUGE, LOUISIANA 70804

22-1 The data in Table IV-10 represents forecasts of total direct employment (SIC Code 13) by place of work associated with Sales 67 and 69. These estimates are on an annual basis and are founded on historic relationships between exploration/development requirements (e.g., number of platforms, number of wells by type, and miles of pipeline) and personnel needs. According to Table IV-10, the peak year for total direct employment in the study area which would result from Sales 67 and 69, as proposed, would be 1984. The geographic breakdown of such total direct employment would be: Louisiana - 1,740; Texas - 1,220; Florida Shelf - 760; and the Upper Gulf - 340.

22-2 Drilling activities are not expected to increase the work force in Louisiana and Texas. This conclusion is stated in Section IV.C.4.b. and is illustrated in Table IV-11. Instead, such activities will allow the continuation of existing employment levels in those areas.

22-3 Oil and gas industry publications throughout the past year have addressed the high demand for rigs, the tightness of supply, the boom for new orders, and whether or not construction would be able to keep pace with rig requirements. These sources have indicated that the rig construction industry is currently satisfying rig demand and that maximum utilization of existing rigs is occurring at this time. In fact rig construction, as well as new orders, has been so great that concern is being expressed about a possible over building situation as early as 1983-1984, particularly for the larger jackups. It is expected that proposed Sales 67 and 69 will continue the existing demands on the rig construction industry in Texas and Louisiana, but will not require any major additional facilities for such activity.

22-4 The employment pattern depicted in Figure IV-4 for the 1976-1977 period is based on actual oil and gas employment data from the U.S. Department of Commerce. The figure depicts a general increase in direct employment in Louisiana over the 1967-1972 period with a decline thereafter until 1977, the latest year available at the time this analysis was prepared. This pattern is accurately discussed in section IV.C.4.b., including probable reasons for its occurrence.

STATE OF LOUISIANA
DEPARTMENT OF CULTURE, RECREATION AND TOURISM
OFFICE OF PROGRAM DEVELOPMENT

DAVID L. TREEN
Governor

ROBERT B. DeBLIEUX
Assistant Secretary

MRS. LAWRENCE H. FOX
Secretary

May 12, 1981

MAY 14 1981

United States Department of the Interior
Bureau of Land Management
New Orleans Outer Continental Shelf Office
Hale Boggs Federal Building
500 Camp Street - Suite 841
New Orleans, LA 70130

Re: Draft EIS for Proposed Outer Continental Shelf
Oil and Gas Sales 67 and 69

Gentlemen:

23-1 My staff has reviewed the above-referenced report and based on the information contained therein we concur with your intention of requiring remote sensing surveys on the tracts located in the high probability area within the archaeological demarcation line.

If we may be of any further assistance, please contact my staff in the Division of Archaeology and Historic Preservation.

Sincerely,

Robert B. DeBlieux
State Historic Preservation
Officer

RBD/JKK/ap

DIVISION OF ARCHAEOLOGY AND HISTORIC PRESERVATION
P. O. Box 44247 Baton Rouge, La. 70804 504 342-6682

23-1 Thank you for your comment.

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PLANNING
COMMISSION
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STATE OF LOUISIANA
DEPARTMENT
OF TRANSPORTATION
AND DEVELOPMENT

PAUL J. HARDY
Secretary

JOHN LeBOURGEOIS
Acting Executive Director

NEW ORLEANS OCS
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ROUTE INITIAL
___ MGR. ___
___ ASST. MGR. ___
MAY 18 1981
___ P. LEGAL ___
___ PAO ___
___ EAO ___
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___ STUDIES ___
___ MGMT. SER. ___

May 14, 1981

Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
500 Camp Street, Suite 841
New Orleans, Louisiana 70130

Dear Sir:

Subject: Proposed OCS Oil and Gas Lease Sales 67 and 69

The draft EIS for Proposed OCS Oil and Gas Sales No. 67 and 69 refer to a broad range of nominated lease sites, stretching across the Gulf of Mexico from Texas to Florida. A number of tracts are found east and southeast of the Chandeleur Islands, which fringe St. Bernard Parish and there are sites off Grand Isle that are several miles from Jefferson Parish waters.

In reference to local impacts:

1. The sites east and southeast of the Chandeleur Islands are seaward of active drilling sites in Chandeleur Sound. Since the habitat is much more critical and sensitive west of the islands, in the Sound, where oil and gas activities are permitted by the Corps of Engineers and St. Bernard Parish, the Regional Planning Commission is not likely to take issue with the proposed sales in similar environmental grounds.

2. Sites off Grand Isle are several miles from Jefferson Parish waters, and not likely to have a direct impact on the parish. Only a few tracts are in the area.

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Manager
New Orleans OCS Office
May 14, 1981
Page 2

In reference to general impacts:

1. All proposed sites are seaward of the 3 mile limit and therefore are under federal jurisdiction.

2. The total lease sales may consist of a maximum of nearly 2.5 million acres. A sale of this magnitude requires an intensive effort from the lead federal agencies (BLM and USGS) in developing their environmental and economic assessments. This constraint should be taken into consideration if much larger sales are contemplated with existing personnel and resources.

We trust that these comments will suffice and assist you in your final recommendation on this project.

Sincerely,

REGIONAL PLANNING COMMISSION

John Le Bourgeois

JOHN LEBOURGEOIS
ACTING EXECUTIVE DIRECTOR

JL/BAP/rr

24-1 Thank you for your comments.

WILLIAM WINTER
Governor

MISSISSIPPI DEPARTMENT OF WILDLIFE CONSERVATION

Bureau of Marine Resources
P. O. Drawer 959
Long Beach, MS 39560
(601) 864-4602
Enforcement
Division - 374-3206

Commissioners:

Allen D. Bruton
Scooba, MS

L.C. "Billy" Gollott
Biloxi, MS

Dr. Edmund Keiser
Oxford, MS

Jim Hunter McCaleb
Cleveland, MS

Fred K. Rogers
Clinton, MS

RICHARD YANCEY
Executive Director

RICHARD L. LEARD
Bureau Director

May 4, 1981

Mr. Heino Beckert
Bureau of Land Management
500 Camp Street, Suite 841
New Orleans, LA 70130

RE: CH# MS810325-005-R Draft EIS for Gas Lease Sales 67 and 69

Dear Mr. Beckert:

The Bureau of Marine Resources is responsible for managing Mississippi's Coastal Resources, in cooperation with the Bureau of Pollution Control, the Bureau of Land and Water Resources, and the Department of Archives and History. This cooperation is carried out under the Mississippi Coastal Program by procedures for state agencies to review proposed activities in the coastal area to insure that the activities are in compliance with the coastal program. The referenced activity has been reviewed, and its status, as indicated below, is hereby certified:

___ The coastal program does not cover the proposed activity. Mississippi has determined that Section 307 of the Coastal Zone Management Act does not apply.

_X_ The proposed activity is consistent with the coastal program. The review procedures of the program have been completed, and the requirements of Section 307 of the Coastal Zone Management Act have been met. Any agency comments received are attached.

___ This activity is conditionally consistent with the coastal program. The review procedures of the program have been completed, and the requirements of Section 307 of the Coastal Zone Management Act have been met, provided that the attached conditions are complied with.

___ This activity is not consistent with the coastal program and does not meet approval requirements under Section 307 of the Coastal Zone Management Act. The attached information explains the conflicts between the proposed activity and the coastal program, and explains the avenues of appeal and conflict resolution.

___ A certification of consistency with the coastal program is being withheld, without prejudice, due to insufficient information. Information requirements are attached.

___ The proposed activity cannot be reivewed, but may proceed subject to further coordination as indicated in the attached comments.

___ Other

If you have any questions concerning this matter, please contact our office.

Sincerely,

Richard L. Leard

Richard L. Leard, Ph.D.
Bureau Director

25-1 Thank you for your comment.

RLL:mac
cc: Mr. Jim Gregory

WILLIAM WINTER
Governor

MISSISSIPPI DEPARTMENT OF WILDLIFE CONSERVATION

Bureau of Marine Resources
P. O. Drawer 959
Long Beach, MS 39560
(601) 864-4602
Enforcement
Division - 374-3206

Commissioners:

Allen D. Bruton
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RICHARD YANCEY
Executive Director

RICHARD L. LEARD
Bureau Director

NEW ORLEANS OCS
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___ MGMT. SER. ___

May 14, 1981

Mr. John L. Rankin, Manager
U.S. Department of the Interior
Bureau of Land Management
New Orleans Outer Continental Shelf Office
Hale Boggs Federal Building
500 Camp Street - Suite 841
New Orleans, LA 70130

Dear Mr. Rankin:

The Bureau of Marine Resources (BMR) has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Gulf of Mexico Oil and Gas Lease Sales No. 67 and No. 69. In our opinion, the DEIS adequately addresses the environmental issues and concerns relative to both sale areas.

Prior to the presently proposed lease sales, the closest tracts offered for lease on the OCS in this vicinity (OCS Sale No. 51 and No. 58) were located no closer than 15 miles from the shoreline. It is our understanding that five of these tracts are now active leases. Now of particular interest is the offering of the twenty-one (21) nearshore tracts (Sale No. 67) located at a relatively short distance of 3-9 miles off the shorelines of barrier islands in Mississippi and Alabama waters. The offshore islands, productive inshore estuaries and related wildlife and fisheries habitats host a diversity of important public and private environmental and recreational resources. The State of Mississippi wishes to emphasize the extreme importance of minimizing impacts and maintaining the integrity of these resources should oil and gas development on these nearshore tracts become a reality.

As stated in the DEIS, the greater part of the areal extent of four (4) of the twenty-one (21) lease tracts, is located within established navigation fairways. These areas lie adjacent to Mississippi's seaward territorial boundary directly south of the Gulf Islands National Seashore Wilderness Area (Petit Bois Island). Since oil and gas structures are forbidden in navigation fairways, the closest point any such structure, utilized for exploration, development and production, is likely to be constructed is at least six (6) miles from the established wilderness area and three (3) miles from the state's seaward boundary. Industry's interest in those tracts contiguous to the Mississippi/Alabama territorial waters is apparently concentrated on the gas-producing potential of the area. No commercial reserves of oil are believed to exist in the area. If these tracts are to realize only gas-oriented development, the probability for harmful environmental impacts would be reduced when compared with the threat inherent in oil related development and production activities.

An examination of the Comprehensive Oil Spill Risk Analysis for Sales Nos. 67/69 indicates that the estimated probability of a major oil spill threatening the Mississippi coastline as a result of these OCS activities is relatively insignificant. Due to the relative proximity of several of the proposed oil bearing tracts to the barrier islands and mainland, the knowledge of possible/probable oil spill trajectories is of considerable

Mr. John L. Rankin, Manager
May 14, 1981
Page two

value in potential impact evaluations.

As outlined in the DEIS one major alternative, Alternative B-3 (Deletion of 21 Mississippi/Alabama Nearshore Tracts, to holding oil/gas lease Sales No. 67 and No. 69 as proposed was discussed at some length in Sections II (pages 55-59) and IV (pages 159-160). Following an indepth review of this data and information, it was determined as suggested in the Alternative B-3 text discussion, that no real basis exists for elimination of these tracts from the proposed sale. The Bureau of Marine Resources recommends that Lease Sales 67/69 be held as proposed.

Participation in this review represents a continuing effort by the Bureau of Marine Resources (BMR) to cooperate with the Bureau of Land Management (BLM) in the development of the Gulf of Mexico OCS oil and gas resources. We appreciate the opportunity to review this Draft Environmental Impact Statement and provide these comments in the interest of insuring that OCS development proceeds with the benefit of full information associated with the proposed action.

Sincerely,

Richard L. Leard
Richard L. Leard, Ph.D.
Bureau Director

RLL:JSF:CML:mac

26-1 Thank you for your comments.

Shell Oil Company

One Shell Square
P. O. Box 60193
New Orleans, Louisiana 70160

Lloyd G. Otteman
General Manager Offshore Division
Eastern E & P Operations

May 11, 1981

Mr. John Rankin, Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
500 Camp Street, Suite 841
New Orleans, LA 70130

Dear Mr. Rankin:

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
OCS SALE NOS. 67 AND 69

Pursuant to the March 20, 1981, Notice of Availability of the DEIS for OCS Sale Nus. 67 and 69 and the solicitation of comments which will assist the agency in its decision-making role, Shell Oil Company offers the following for your consideration.

27-1 Shell supports the inclusion of all of the acreage as proposed for these two sales (Alternative A) and strongly urges against the deletion of tracts as provided by Alternatives B-1, B-2, and B-3.

27-2 With regard to Alternative B-1, we believe there is no justification for the deletion of 126 tracts in order to protect biologically sensitive areas. The lease stipulations outlined in the DEIS (prohibition of activity in the immediate vicinity of the banks, shunting and/or monitoring certain distances from the 85 M isobath, and photo documentation of suspected "live bottom areas" with limitations on discharges, if necessary) provide adequate protection for the biota and their habitat.

27-3 In response to Alternative B-2 (deletion of 59 tracts on water depths greater than 400 meters), we direct your attention to Shell's previous oral testimony presented at public hearings for OCS Sale Nos. 56 and 59, copies of which are attached. We firmly believe that deepwater technology is available to ensure the exploration and development of these tracts in a safe manner.

27-4 As regards Alternative B-3, the DEIS indicates that drilling activity in the Upper Gulf Offshore Development (UGOD) area will precipitate certain environmental consequences. Certainly, drilling activity in the UGOD area will in some way impact the Mississippi/Alabama outer islands area, but it will not cause the initial impact as addressed in the DEIS. Alabama has already approved drilling activity in state waters located adjacent to the UGOD area. Presently 2 to 3 rigs are drilling between Dauphin Island and Fort Morgan on Blocks 76, 77, 94, and 95. Further, Alabama has just completed a lease sale that will allow future drilling on additional blocks in this same area. Lessees are now filing permits to begin drilling on these new blocks as soon as possible. Therefore, since drilling activity has begun in state waters, Alternative B-3 should not be considered.

27-5 Finally, we wish to comment on the lease stipulation requiring an archeological survey on tracts landward of the demarcation line derived from the Coastal Environments Inc. study. Shell supports the recent revision of the demarcation line which will delete the survey requirements for sale tracts on the Mississippi River Delta which are covered with recently disturbed sediments. We urge the Agency to review the need for surveys on the remaining tracts within this zone. Approximately 50 additional survey miles are required for each tract, if NTL 75.3 is invoked, costing an estimated $10,000. To date, we have not located anything of archeological significance in the years during which this stipulation has been in effect. Assuming that this experience is typical of the entire industry, we see little justification for the continuing of this requirement.

We appreciate this opportunity to submit comments on the DEIS for Sale Nos. 67 and 69.

Very truly yours,

LG Otteman
L. G. Otteman
General Manager - Offshore

Attacl·ments

27-1 Thank you for your comment.

27-2 We agree that there is no need to delete the 126 tracts (Alternative B-1), but this option is included and discussed as an alternative for the Secretary of Interior's consideration because of the high level of interest in these areas by many groups of citizens.

27-3 Thank you for your comment.

27-4 We noted in our cumulative impact discussion regarding Alternative B-3 (p. 58a of the DEIS) that the expected impacts and risks associated with the leasing and development of the 21 Mississippi/Alabama nearshore tracts have been, and likely will continue to be, preceded and potentially aggravated by actions ensuing from state mineral leasing activities and other related and unrelated industrial activities occurring in the issue area. Although the issue has less or more merit under these circumstances depending on your perspective, it is not a foregone conclusion that state leasing and development will negate the environmental implications of leasing these 21 nearshore OCS tracts.

27-5 Please refer to our response to Comment 1-5 for information concerning studies and the deletion of tracts from the archaeological survey requirement.

The statement "To date, we have not located anything of archaeological significance in the years during which this stipulation has been in effect" needs some qualification.

The Department of the Interior's responsibility under the National Historic Preservation Act of 1966, as amended; Executive Order 11593; the National Environmental Policy Act; and the OCS Lands Act, as amended, is to ensure that no archaeological sites of National Register significance (as defined in 36 CFR 800) will be adversely affected by any federally-licensed, funded, or permitted activity. The surveys currently being required on the OCS are designed to locate evidence of cultural resources (man-made objects) which may or may not have archaeological significance, and relict geomorphology which indicates areas with a high probability for associated prehistoric archaeological sites. Based on the survey data, areas of possible archaeological sites (e.g., unidentified magnetic anomalies, unidentified side-scan contacts, and certain relict geologic features) are outlined.

It is then usually required that the lessee either avoid these areas during lease operations or conduct further investigation of these areas prior to initiating any bottom disturbing activity. Due to the fact that in all but a very few instances the lessee has chosen avoidance of archaeologically sensitive areas rather than further investigation, few archaeological sites have been identified.

To date, BLM has more than 50 suspected shipwreck locations as a result of the archaeological surveys which have been required on the OCS in the Gulf of Mexico. Numerous areas have also been recorded which indicate a high probability for containing intact prehistoric sites. Plans are currently underway by BLM to dive on one of the suspected shipwreck locations this summer. Separate studies are also being proposed for the investigation of additional suspected shipwreck sites and areas with a high probability for prehistoric site occurrence. The results of such studies will be used to further refine high probability areas for site occurrence and survey procedures.

EXXON COMPANY, U.S.A.
POST OFFICE BOX 4279 · HOUSTON, TEXAS 77001

EXPLORATION DEPARTMENT
GULF/ATLANTIC DIVISION

HARRY D. MARTIN
MANAGER

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April 14, 1981

Proposed Gulf of Mexico
OCS Oil & Gas Lease Sales Nos. 67 & 69

Mr. John L. Rankin
Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
500 Camp Street
Suite 841
New Orleans, Louisiana 70130

Dear Mr. Rankin:

Reference is made to the notice published in the Federal Register, Vol. 46, No. 57, Wednesday, March 25, 1981, inviting oral and written comments on the Draft Environmental Impact Statement recently made available for Sale Nos. 67 and 69 in the Gulf of Mexico OCS. Exxon will not send a corporate representative to the public hearing because the Offshore Operators Committee will present the in-depth technical response to the Draft Environmental Impact Statement. We do wish to submit an individual written comment supporting both sale proposals.

28-1 One general issue which the Department of the Interior wants to see fully developed at the hearing is industry interest in the sales. In this regard please allow me to reaffirm that Exxon believes that a great potential exists for the discovery of new oil and gas fields in the Gulf of Mexico and that you should continue holding regular sales in this area for so long as industry shows an interest.

Very truly yours,

HDM/CR/ald

28-1 Thank you for your comments.

A DIVISION OF EXXON CORPORATION

Gulf Oil Exploration and Production Company

G. B. Scarborough

P. O. Box 61590
New Orleans, LA 70161

May 8, 1981

Manager, New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building, Suite 841
500 Camp Street
New Orleans, Louisiana 70130

Gulf of Mexico - Offshore
Texas, Louisiana, Mississippi,
Alabama, and Florida,
OCS Lease Sales Nos. 67 and 69

Dear Sir:

Gulf Oil Corporation respectfully submits the attached statement in support of the proposed Outer Continental Shelf Oil and Gas Lease Sales Nos. 67 and 69 - Gulf of Mexico - March and August 1982.

Very truly yours,

Gulf Oil Corporation

By____________________

GBS/cs
Attachment

29-1 Thank you for your comments.

Gulf

A DIVISION OF GULF OIL CORPORATION

STATEMENT OF
GULF OIL EXPLORATION AND PRODUCTION COMPANY,
A DIVISION OF GULF OIL CORPORATION,
IN SUPPORT OF PROPOSED 1982
OUTER CONTINENTAL SHELF OIL AND GAS
LEASE SALES NOS. 67 and 69
GULF OF MEXICO

Gulf Oil Exploration and Production Company, a Division of Gulf Oil Corporation, is grateful for this opportunity to make known its position with regard to the proposed 1982 Federal Lease Sales of 472 tracts in OCS Sale Nos. 67 and 69 offshore Texas, Louisiana, Mississippi, Alabama, and Florida, and the attendant draft environmental impact statement.

The Draft Environmental Impact Statement is an exhaustive, objective study and evaluation of the environmental impact of the proposed sales, the adverse environmental effects which cannot be avoided should the proposal be implemented, alternatives to the proposed sales, the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources which would be involved in the proposed sales should they be held. Gulf concurs generally with the Draft Environmental Impact Statement and urges that the lease sales totaling 472 tracts be held as proposed.

Gulf believes the proposed lease sales are essential to the economic well-being of the United States. The opening up of additional tracts on the Outer Continental Shelf for lease sale is the most realistic and effective method of alleviating energy shortages. The lease sales of the 472 proposed tracts would add 2,458,827 acres to the current total of Outer Continental Shelf lands under federal lease. U. S. Geological Survey estimates that offshore reserves from these sales could be as much as 77.19 million barrels of oil and 1526.63 billion cubic feet of gas.

The country's production of oil and gas has declined significantly in recent years, but demand for energy is rapidly increasing. In recent winters we have experienced harsh effects of a shortfall in natural gas supplies causing severe losses in industrial production and rises in unemployment. Recently this country experienced a gasoline shortage brought about in part by the cessation of Iranian oil exports. Further, purchases of foreign oil are adding to the United States' problems in the areas of foreign balance-of-payment and foreign exchange.

Unless the United States reduces its reliance on imported oil by immediately taking steps to increase its domestic offshore production, the economy will continue to be unstable and vulnerable to strikes (such as the recent coal strikes), political embargoes and disruptions in Middle East exports. The November 12, 1979 issue of Oil & Gas Journal in printing an API Special Report at page 164 forecasts:

> The next decade will be a period of what one forecaster calls "uneasy equilibrium," another "heightened sensitivities" in energy supply and demand.
>
> Energy surpluses will be rare, as production stabilizes and demand continues to grow. As a result, importing nations will be increasingly vulnerable to supply interruptions that translate into immediate shortages. Major industrial countries may be able to fulfill pledges not to increase oil imports above existing levels because increased volumes may not be available.

What has been said up to this point has not been to ignore the environmental aspects of the proposed lease sales but rather to suggest the perspective in which they must be considered. Even if the environmental risks were much greater than they are, economic problems and other considerations relating to the national interest would compel that development. Fortunately, the risks to the environment are minimal. The United States is not forced to choose between economic well-being and a clean environment. It can have both petroleum development and a properly managed and safeguarded environment.

Admittedly, operations to find and produce offshore oil and gas are not without some risk, but the history of offshore exploration and production over the past twenty years shows that the accident rate has been very low and that no permanent damage to the environment has resulted from oil spills or other occurrences. Gulf is dedicated to preserving the ecological balance in all areas where it conducts operations, and it pledges to continue that effort in exploring and developing the areas offshore the Gulf states.

Gulf actively participated in the first offshore lease sale held in 1954 and has had many years of experience in the development of oil and gas in the Gulf of Mexico. Through voluntary industry action and federal and state regulation, a wide variety of preventive planning and countermeasure programs have been developed to prevent spills and to minimize or eliminate damage in the event that spills do occur. Gulf has established a comprehensive program to train its personnel in advanced safety techniques. Selected Gulf employees participate in a school of automation technology to train personnel in preventive maintenance for minimizing equipment malfunctions. Gulf operates a drilling school which provides six weeks of comprehensive and intensive training in all areas of drilling and completion practices with emphasis on well control and safety. Gulf research personnel also conduct a seminar and on-rig training program covering such subjects as proper blowout-preventor operations and early detection and control of possible blowouts. An oil spill contingency plan has been developed which would become effective in case an offshore emergency occurs. This plan, which has been implemented for Gulf of Mexico operations, creates a special emergency action group composed of specially trained operating personnel who are immediately relieved of their normal company assignments so they can deal exclusively with the emergency.

In addition to its own special activities for promoting environmental safety, Gulf participates with other companies and organizations in environmental protection programs. One such cooperative undertaking of particular note is "Clean Gulf Associates." Formed to supplement other programs, it is an industry-wide effort to maintain personnel and equipment to react should an offshore emergency occur. Under this program a well-known offshore contractor stockpiles specialized containment and clean-up equipment at key locations along the Gulf coast. The contractor maintains a staff of supervisory personnel, including engineers, who are especially knowledgeable in operating containment and clean-up equipment. The services of the organization are available to all members, and there are special provisions to make the services available to non-members.

As all in the petroleum industry are well aware, very strict controls over all offshore petroleum operations are being enforced continually by the United States Geological Survey, the Coast Guard, the Environmental Protection Agency, and the Office of Pipeline Safety. Their regulations, promulgated under strong and comprehensive Congressional legislation, govern virtually all aspects of offshore activity and insure that uniform and approved precautions are taken in all operations. Gulf will continue to observe these regulations, as it has in the past, and will continue its participation in organizations such as the Offshore Operators Committee, the American Petroleum Institute, and other industry groups which work with the regulatory agencies to establish new standards and practices and to improve those presently in existence.

To summarize, the United States greatly needs the oil and gas reserves of the Outer Continental Shelf lands in the area of the proposed lease sales. These reserves can be developed with no long-term adverse effect on the environment. Gulf pledges that it will continue to cooperate with all governmental authorities in seeing that exploration and development operations are conducted safely. Gulf Oil Corporation respectfully urges that the offshore lease sales be held.

G. B. Scarborough
Vice President
Gulf Oil Exploration and Production
Company, a Division of Gulf Oil
Corporation

Coastal Ecology Laboratory
Center for Wetland Resources
LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE
BATON ROUGE • LOUISIANA • 70803
504/388-1558

May 15, 1981

Mr. John Rankin
New Orleans Outer Continental
  Shelf Office
Hale Boggs Federal Building
New Orleans, LA 70130

Dear Mr. Rankin:

I have been reviewing BLM's draft EIS for the proposed OCS oil and gas sales. On the whole, I found the report very comprehensive, covering many of the environmental consequences of oil and gas drilling in the OCS. There are, however, a number of questions, that I feel need to be answered plus some information I also feel needs to be included.

30-1 Although almost every environmental impact is addressed, they appear to be given little importance. I detect in this EIS an attitude, fostered by the need for more oil and gas, to stifle any impacts which might interfer with OCS development. It is the logic used to justify a certain conclusion that gives this attitude. For example, on page 126, is the statement:

> "So, assuming full development in ten years from this proposal, an average of 67,000 tons of mud solids a year will be discharged; this is .003% of solids contributed by rivers, .02% of that contributed by the Mississippi River.... This is indeed an insignificant amount which becomes lost in the noise of the major contributions."

This is a true statement, but it implies that a very minor impact will
result, when, as you know, for many sensitive areas just the opposite is
true. Where in this EIS is the long-term dispersion of these discharges
along the seabed discussed? This same logic appears in part C.1.b. of
30-2 section IV, where it was found that the probability of an oil spill of
greater than 1,000 barrels from existing federal leases or existing
transportation was already 0.99+. The lease sales did not increase this
probability, which makes sense since the statistical parameter is limited
in range from 0 to 100. It is therefore concluded that; "The major
influences here is not the production associated with the leases offered
for Sales 67 and 69 but rather with existing leases and those risks
associated with the transportation of oil." Again, this is a true
statement, but it implies that new OCS development presents no risks.
What it really means is that as old OCS drilling operations are shut
down and new ones take their place the risk of a large oil spill will be

COASTAL STUDIES INSTITUTE • OFFICE OF SEA GRANT DEVELOPMENT • DEPARTMENT OF MARINE SCIENCES
COASTAL ECOLOGY LABORATORY • SPECIAL PROJECTS OFFICE • LABORATORY FOR WETLAND SOILS AND SEDIMENTS

30-2 maintained at 0.99+ percent. How can environmental damage be minimized when high risk values are maintained over long periods of time?

30-3 The attitude I refer to is occasionally very blatant. The statement made on page 146, referring to the effects of an oil spill in the Flower Garden Banks; "The principle threat (of an accident) would be to the research potential of the banks," is distressing. These areas are large storage banks of genetic information molded by millions of years of evolution. The threat would be a decrease in the ecological information content from which new species evolve.

30-4 I feel it is important to mention in this EIS that land loss is accelerating and any landfall pipeline, growth of coastal cities or ship traffic will have a large impact, especially in Louisiana. The indirect effects of industrial development will be a loss of wetlands (Gosselink and Baumann, 1978). I have enclosed 2 papers dealing with this subject. Land Loss in Coastal Louisiana refers to the causes and impacts of wetland loss. Pages 246-247, specifically, have information on wetlands as storm and waste buffers, which should be included in the EIS. These authors feel that canals account for 69% of total land loss and they are widening as a result of boat traffic at a rate an order of magnitude greater than the present land loss rate. What will happen to these canals as a result of these OCS sales?

30-5 The other paper, by Gael and Hopkinson, refers to the increase in eutrophication as a result of canalization in drainage basins. Nutrients are rapidly shunted downstream causing a change in the ecology and diversity of organisms. Productivities of soft shell crabs, shrimp, and oysters are likely to be effected if drainage density in Louisiana increases as a result of OCS activities.

30-6 I believe there are two important topics in this EIS that require some form of data or reference to justify the conclusions. First, on page 128, when referring to radionuclides, the statement is made that; "Naturally ocurring radionuclides are found in formation waters at higher levels than in open seawater, but these have proved not to be a hazard for the offshore environment." How was this proven? Could it be a hazard to man? Second, on page 127, it is reported that no damage is caused by discharges of the trace elements Cu, Cr, As, Zn, and Mn. How was this conclusion reached? Were any studies done?

Below is a list of questions, other then the ones already mentioned, which I feel need to be addressed.

30-7 1) Why is it necessary to lease such vast areas all at once? Is this the most efficient use of time and capital? The process of leasing OCS tracts is unfamiliar to me, as such, this question does not necessarily reflect any problems with the EIS.

30-8 2) In the oil spill risk analysis, why is the data presented as Number of Spills rather than Number of Barrels Spilled? Is the data base insufficient? Wouldn't more information be conveyed?

30-9 3) Also, in the oil spill risk analysis, are two factors that could increase the risks, but were not included in the list of assumptions on page 115. First, do deep water operations pose any greater risk than near shore operations due to their distance from the coast and the depth of the water? If they do, was this included in the model? Second, now that Louisiana has an offshore oil superport, have the risks involved in trafficing supertankers in and out of these waters been included in the model?

30-10 4) It has been proposed that no mud and cuttings be discharged into biologically sensitive areas, such as, the Flower Garden Banks. These discharges are to be piped 1-2 nmi away from the edge of these banks. What will be the environmental impact of the pipeline construction through these areas?

30-11 5) Why is there no explanation for the projected employment trends without Sales 67 and 69? Figure IV-4 is based on some kind of model. What are the assumptions of that model? No new resident population growth is expected for Louisiana, thus, it is concluded the OCS proposed sales will have no effect on community services. Are there communities that have already strained their ability to adequately provide facilities and services? If so, will OCS sales maintain the strain, increase it or decrease it?

30-12 Writing an EIS is a difficult thing. One never really knows all the environmental problems that will arise from the activities of man. I sympathize with you. Please realize, however, that I and many others feel the decision to further develop the OCS should not be taken lightly.

30-12 Louisiana has only one public barrier island beach, land loss is increasing, populations are booming, water quality is decreasing, and on and on. I hope my criticisms and questions help produce an EIS that will show future generations that we thought of their welfare as well as our own.

Sincerely,

Fred H. Skla

Fred H. Sklar
Research Associate/Ph.D. Student
Coastal Ecology Laboratory
Center for Wetland Resources
Baton Rouge, LA 70803

jlw
Enclosures

30-1 We do indeed believe, rather than merely imply, that the impact of the discharge of mud solids into the Gulf of Mexico is very minor indeed. The dispersion of these solids is discussed in Section IV.D.1.a. (pp. 144-150 of the DEIS).

30-2 Please refer to Table 1 (Appendix D) on page 284 of the DEIS. Here we can compare the risks associated with the existing leases, proposed leases, and existing transportation. The major risk due to oil spills can be clearly seen to lie in the existing leases and even more in transportation. The expected number of spills and the probability of one or more spills occurring is quite low relative to Sales 67 and 69. The expected number of spills due to Sales 67 and 69 is less than one. This is significantly less than those expected relative to existing leases or transportation. Also, we must consider that these figures are projected over the entire lease life of Sales 67 and 69 and thus, expected less than one spill to occur over this period as a result of these sales. Also, reference is made to a comparison between Tables E1 and E2 (pp. 110-111 of the DEIS) whereby we see that using an estimated decline in OCS production and replacing that resource with imported resource actually increases the risk factor. Thus, the analysis shows environmental risk to be increased if we replace OCS production (equally) with foreign import.

30-3 We agree with the statement that "The principle threat (of an accident) would be to the research potential of the banks" (p. 146 of the DEIS) is in error, and the statement has been deleted.

30-4 No new pipeline landfalls are expected in Louisiana as a result of these two lease sales. Existing oil and gas pipeline networks are expected to accommodate production on the OCS with the possible exception of oil and/or gas finds off the Gulf coast of Florida. This EIS covers only the projected impacts of these two lease sales. Actual construction of offshore production structures, including additional pipelines, onshore production, refining, and support facilities, should their construction become necessary, would, if mandated by federal and state laws, require the preparation of site-specific environmental assessments and/or environmental impact statements.

Not all tracts listed in this EIS will actually be leased. Industry may not bid on every tract, and if bids received are too low, the government will not lease the tracts. Furthermore, not all tracts leased actually produce enough oil and/or gas for economically justifiable production of these resources.

Section IV.C.5. (Marsh Loss) identifies the factors contributing to loss of wetlands in the Louisiana Coastal Region (LCR). As pointed out in this section, OCS oil and gas activities, due to their offshore location, make no direct contribution to marsh loss; and since no new onshore infrastructure development is expected in Louisiana as a result of these two sales, indirect contributions to wetlands losses in Louisiana are limited to bank erosion due to crew boat and other support vessel traffic. What percentage of erosion of existing canal banks is attributable to oil and gas related boat traffic versus erosion caused by other users of coastal canals and waterways, such as commercial and private shrimp and fishing boats, pleasure craft, etc., is impossible to determine. As stated in the above referenced paragraph, it is considered extremely unlikely that additional navigation or pipeline canals will be dredged in the LCR as a result of these proposed sales.

We appreciate the reference regarding the importance of wetlands as storm buffers and nutrient recycling systems and have included this information in the discussion of marsh loss.

30-5 As you note, the paper you kindly sent to us does indicate a significant correlation between eutrophication and density of canals in the Barataria Basin. The paper also notes that the driving force for this eutrophication is runoff from developed (mostly agricultural) upland area, augmented by canals which circumvent natural sheet-flow of runoff across the wetlands. The paper is internally inconsistent as to whether the greatest degree of canalization is associated with onshore oil and gas activities (p. 156 of the DEIS) or with agricultural development (p. 162 of the DEIS). In any event, your concern that additional canalization will be detrimental to local water quality is well taken; however, we anticipate no significant increase in the number or size of canals as a result of the proposed sales. Canals associated with offshore oil and gas activities, as opposed to onshore activities in state waters or wetlands, consist only of pipeline routes and navigation canals for service or other types of vessels. At most we anticipate one additional pipeline from the OCS to some onshore location in Louisiana as a result of the proposed sales, and no additional navigation canals are anticipated. Since the one additional pipeline will result in only a very minor cumulative addition to the present infrastructure, and since the impacts of laying the pipeline may be mitigated by requirements of the appropriate federal and state permitting agencies, we anticipate no significant additions to the onshore drainage density and no significant long-term impacts to the environmental quality of the region.

30-6 In retrospect, our statement concerning radionuclides was poorly worded and has been reworded. This brief discussion on radionuclides was taken from the record of proceedings of a workshop held under BLM auspices in May 1980, at which Dr. David Reid of the Naval Ocean Research and Development Activity (NORDA), NSTL Station, Mississippi, presented information derived from his studies of radionuclides in formation waters from onshore locations in Louisiana and offshore locations in the central Gulf of Mexico. Briefly, his conclusion was that discharges of radionuclides could present a problem in onshore or wetland habitats, but that dilution offshore mitigated any impacts and so these discharges presented no hazard to the offshore environment. The summary of his presentation is included in Technical Report 80-T-11 of the Department of Oceanography, Texas A&M University.

Our conclusion that discharges of produced formation waters containing certain trace elements seems to cause no damage is based on the results of several studies and sets of observations. This statement should be qualified by noting that we are discussing only discharges of produced formation waters in the offshore, marine environment and that "no damage" means no significant impact on communities in the area. Information available to us indicates that in the offshore environment, discharges of produced formation waters will impact fouling communities on the production platforms at distances of 10 m or so, or less; beyond 10 or 20 m, there is no observable impact on the fouling communities, and within a few meters there is no observable impact on the pelagic communities associated with or passing through the vicinity of the platform. In shallow nearshore waters or wetlands, however, discharges of produced formation waters may have a pronounced impact, the magnitude of which will vary with the hydrography of the environment into which the waters are discharged and the nature (primary salinity) of the discharged waters. Further information on produced formation waters and the impact on the environment may be found in the papers of Gallaway (1981), Gallaway, et al. (1980), LGL Ecological Research Associates (1980), Howard, et al. (1980), Mackin (1971, 1973), and Offshore Operators Committee (1975).

30-7 Leasing tracts on a Gulfwide basis is indeed the most efficient method since in this way wasteful duplication of work and administrative efforts are minimized.

30-8 To project a quanity of oil spilled would not be as informative as projecting the probability of spill occurrence and the expected number of spills (over a range of volume). In order to project a quantity of oil spilled, we would have to know the volume of oil under each lease. Even then it would be nearly impossible to assess impacts with this information. As the Oil Spill Risk Analysis model is configured, we can project the probability of occurrence (over 1,000 bbls), quantify how many are expected, and assess the impacts of these on various targets.

30-9 As a statistical base, the Oil Spill Risk Analysis model has all reported accidents resulting in oil spills 1,000 barrels or larger. The risk analysis is based on the actual occurrence of accidents, and this includes any resulting from deepwater activity. Therefore, we can only perform the analysis based on this data set, not on any assumptions about the future safety of oil production. Also, the risk analysis (dealing with transportation) uses import volumes as a basis for analysis; thus, we consider all imported oil regardless of size of vessel. The import volumes are apportioned to appropriate routes depending on their port of entry. This gives us an aerial analysis as close to real life as we can get at present.

30-10 Nowhere in the DEIS was it stated that discharges would be piped away from sensitive areas such as the Flower Garden Banks. Indeed, we do not feel that such an undertaking would be wise, much less required. The stipulation on leases near such areas requires that the discharges be shunted through a downpipe to within 10 m of the bottom in order to prevent these discharges from impacting the sensitive areas at the tops of the nearby banks (no activity at all is permitted on the banks proper).

30-11 The explanation of projected employment trends in Louisiana without Sales 67 and 69 was mistakenly omitted. This information is now included in Section IV.C.4.b. Regarding any existing strain on local communities associated with Louisiana OCS exploration and development, it is our opinion that they are adequately providing the necessary services and facilities. Generally, any excess demand for economic goods such as housing, roads, schools, etc., over recent years in communities such as Morgan City has been quickly met by an increased supply of the necessary services and facilities. In fact, a greater concern has been expressed by most communities on the impact of any reduced OCS production activity in the Gulf of Mexico, for any reason. In short, Sales 67 and 69 will serve to maintain a desirable level of economic activity and related demands on local services and facilities according to the goals of the affected communities.

30-12 We appreciate your comment. The Department of the Interior and BLM's New Orleans OCS Office do not take oil and gas development on the OCS lightly, as evidenced by the scoping process, conducting of public hearings, and the preparation of EIS's which are all designed to identify the major issues of public and private concern. These efforts form the basis on which the Secretary of the Interior makes his decision as to which tracts to offer for leasing.

Defenders
OF WILDLIFE

May 8, 1981

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Mr. John L. Rankin, Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Building
500 Camp Street, Suite 841
New Orleans, Louisiana 70130

Re: Draft Environmental Impact Statement, Proposed OCS Oil and Gas Sales 67 and 69.

Dear Mr. Rankin:

Defenders of Wildlife ("Defenders") is a national, non-profit, public interest organization, dedicated to the protection of America's wildlife resources and the natural environment. On behalf of its more than 51,000 members, Defenders submits the following comments regarding the above-referenced document.

The focus of these comments is -- once again -- directed at the inclusion of two Flower Garden Banks tracts (67-224 and 67-225) into the proposed sale area. As you may recall, this organization expressed its extreme disappointment at the inclusion of these same two tracts into the Final Environmental Impact Statement tract listing for OCS Sale A66.1/ (The tracts had not appeared at all in the Draft EIS for that Sale.) For reasons apparently not having much to do with the substantive issues or resources involved, the two tracts were deleted from the final sale listing.2/

In spite of what this organization believes were rather compelling arguments for not permitting oil and gas development activities in such close proximity to the biologically fragile resources at Flower Garden Banks coral reefs, the Department of the Interior ("Interior" or "DOI") continues to exhibit a stubborn and unreasoned determination to lease these two tracts. This determined action by the DOI is unreasonable and ill-conceived on a number of grounds, which are discussed below. The economic and logical weight of these grounds, Defenders strongly believes urges, at a minimum, the adoption by BLM of Alternative B-4 ("Deletion of Two Tracts Near the Flower Garden Banks") as the final proposed action in this lease sale.

1/ Letter to John L. Rankin, BLM, from Peter S. Holmes and Sherrard Coleman, Defenders of Wildlife, dated January 28, 1981.

2/ DOI/BLM Press Release, "Interior Proposes Gulf of Mexico Outer Continental Shelf Lease Sale in July, 1981," dated March 2, 1981.

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1. The leasing history of these tracts indicates strongly the lack of industry interest in development of these areas. As discussed in Defenders' January 28, 1981 comments on Sale A66, these two tracts (OCS Blocks A-374 and A-375) have been offered several times previously in earlier OCS Sales. Specifically, Block A-374 (tract 67-224) is being proposed for sale for the seventh time; Block A-385 (tract 67-225) for the sixth time. Previous offerings have consistently resulted in either no industry bids, or bids rejected by Interior as insufficient. There are two significant reasons for industry's lack of enthusiasm for these two tracts. The more pertinent of these reasons, at least to the industry, is the limited natural oil and gas reserves estimated to be present in these tracts.3/ Coupled with the cost of technological safeguards required for the protection of reefal ecosystems, it is not surprising that industry has shied away from investing in these tracts.

The more pertinent of these reasons to Defenders is the desirability of protecting the biota at the Flower Garden Banks. Such protection is envisioned by the proposal to designate these areas as a National Marine Sanctuary.

2. The currently unresolved status of the Flower Garden Banks National Marine Sanctuary mandates that actions not be taken which may irretrievably damage or destroy the resources there. It is unconscionable that the DOI continues to offer these tracts during the pendency of this resolution. As the DEIS notes at page 42, the regulations proposed for this Marine Sanctuary would be more protectively restrictive than the biological stipulations outlined at pages 9-10 of the DEIS.

Moreover, the same question of compliance with NEPA regulations as was discussed in Defenders' earlier comments continues to apply to actions taken on this proposed sale. Those regulations, issued November 29, 1978 by the Council on Environmental Quality, state in part:

> §1506.1, (c) While work on a required program environmental impact statement is in progress and the action is not covered by an existing program statement, agencies shall not undertake in the

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3/ The U.S. Geological Survey estimates that these tracts would likely be only 1/4 as protective as others outside the Flower Garden Banks area. See letter from Gus Speth, Council on Environmental Quality to Douglas Costle, Environmental Protection Agency, dated February 13, 1980, page 3.

interim any major Federal action covered by the program which may significantly affect the quality of the human environment unless such action:

> (1) Is justified independently of the program;
>
> (2) Is itself accompanied by an adequate environmental impact statement; and
>
> (3) Will not prejudice the ultimate decision on the program. Interim action prejudices the ultimate decision on the program when it tends to determine subsequent development or limit alternatives.
>
> "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act," 40 CFR Parts 1500-1508.

The Environment impacts of hydrocarbon development and production activities upon the nearby coral reefs at Flower Gardens is at best uncertain. As such, leasing these tracts would effectively preclude a marine sanctuary management scheme capable of ensuring adequate protection for reefal systems. Leasing of these tracts would also eliminate any reasonable alternative to the "preferred" management scheme now being considered by NOAA within the NEPA process. The DEIS offers no explanation for offering these tracts independent of this ongoing evaluation process of the sanctuary proposal. Thus, the offering in fact violates NEPA regulations by limiting management alternatives being considered by another Federal agency.

3. In connection with this evaluation process, the current activities of the Environmental Protection Agency regarding environmental protection in this area should be noted. The EPA is developing very stringent regulations with respect to NPDES permits issued in connection with oil and gas operations near the Flower Garden Banks area. These regulations will most certainly be more restrictive than those detailed in the biological stipulations, and thus will

significantly affect development activities in any event on these two and on several other tracts in the vicinity.

4. The limited amount of estimated resources to be foregone, when weighed against administrative, legal and substantive issues, argues unmistakably for the adoption of Alternative B-4. Deletion of these tracts from the sale would "remove only 0.4% of the tracts under consideration, and would represent a very minor reduction in the estimated petroleum reserves to be offered." (DEIS, p. 59.) Specifically, using mean estimates of oil and gas reserves as projected in the DEIS, this minor reduction (0.4%) translates out to the following petroleum resources:

.30876 million barrels of oil
77.190 million barrels of oil in total proposed sale

and

6.10652 billion cubic feet of gas
1,526.630 billion cubic feet of gas in total proposed sale

All things considered, a convincing argument for offering these tracts at all cannot be made. This is particularly apparent when these estimated foregone reserves are coupled with the BLM's own analysis of Alternative B-4.

> Deletion of these tracts will eliminate potential for cumulative environmental impact at the Flower Garden Banks due to oil and gas operations. Leasing of these tracts will result in cumulative increase in potential for environmental impact at the Flower Garden Banks as a result of increased oil and gas activities in the vicinity of these banks.
>
> (DEIS, p. 60)

5. The "common sense" approach to this sale is the most compelling argument of all. Defenders has no generic opposition to energy development activities on the Outer Continental Shelf -- provided they are conducted in a manner which is sensitive to likely, or even possible, environmental impacts. Such conduct includes the recognition that OCS technology is neither perfected nor fail-safe.

Given that particular recognition, some natural resources are simply too fragile and too irreplaceable to place at risk. This is precisely the situation at the Flower Garden Banks.

The arguments discussed above for not leasing tracts over the Flower Garden Banks have largely been made before in comments on other OCS lease sale proposals. They bear repeating, however, in light of the DOI's demonstrated insensitivity to overriding common sense. The logical response by Interior would be to drop these two tracts from future leasing consideration. The hydrocarbon resources are miniscule compared to those in the remaining 223 tracts in Sale 67 and 247 tracts in Sale 69.

Insistence upon leasing these tracts will only result in unnecessary delays and burdensome administrative procedures. All things seriously considered, Defenders urgently requests that DOI take the responsible (and necessary) action of adopting Alternative B-4.

Thank you for your serious consideration of these comments.

Sincerely,

Sherrard Coleman

Sherrard Coleman
Marine Issues Specialist

cc: Lee Bishop, Esq.
Dr. Nancy Foster
Dr. Thomas Burke
Jim Banks, Esq.

31-1 1. The leasing history of these tracts has no bearing whatsoever on whether or not the tracts can be leased in an environmentally acceptable manner.

2. The currently unresolved status of the proposed Flower Garden Banks National Marine Sanctuary also has nothing to do with responsible leasing in the area; the DEIS for the proposed sanctuary is over two years old. Moreover, the sanctuary proposal seems to be in limbo at the present time. In any event, leasing these tracts would no more preclude an effective sanctuary management scheme than does the presence of already leased tracts within the proposed sanctuary. The Department of the Interior (DOI) and BLM strongly support the establishment of a Flower Garden Banks National Marine Sanctuary, and DOI is able and willing to control the oil and gas industry to the extent necessary to protect sensitive areas on the OCS.

3. The activities of the Environmental Protection Agency (EPA) have little to do with the wisdom of leasing in this area. DOI has developed stipulations to protect the biota of biologically sensitive areas from potential damage due to oil and gas activities over the past seven years in the absence of EPA interest or knowledge in the area. It is our understanding that EPA's NPDES permit conditions for the excepted areas of the General NPDES Permit (46 FR 20284 - 20290; April 3, 1981) may not differ significantly from DOI's stipulation requirements. Even if they do, however, it need not affect the inclusion of these tracts in the sales; EPA will carry out its responsibilities as it deems best under appropriate legislation and its own regulations.

4. The alleged limited amount of estimated resources on these tracts also has little bearing on whether or not to lease. Also, there is no reason to believe that because these tracts represent 0.4% of the tracts offered that they also represent 0.4% of the petroleum reserves.

5. Since the energy development activities resulting from these proposed sales will be conducted in a manner which is sensitive to environmental impacts, the "common sense" approach to this issue, despite Defenders' misgivings, is to offer the tracts as proposed. Alternative B-4, however, does give the Secretary of the Interior the option to delete these two tracts should he be so persuaded.

Sierra Club –

1414 Hilltop Drive
Tallahassee, FL 32303
April 27, 1981

Manager
New Orleans OCS Office
Bureau of Land Management
Hale Boggs Federal Bldg.
500 Camp Street, #841
New Orleans, LA 70130

Dear Sir:

I enclose the following comments in your DEIS Public Hearing record, May 5, 1981.

Comments on Proposed Lease Sales 67 and 69 DEIS
Relative Treatment of west, upper, and eastern Gulf:

33-1 1. Regarding this document as basic framework for all environmental, to follow plans for these lease tracts, it is of concern to us that geographically the eastern Gulf appears to have received inadequate treatment in the resource analysis. Activities in the western and central Gulf are slated for areas that are adjacent to already-leased and/or better known territory than from Mississippi east and south east. The treatment of the Florida Shelf is not satisfactory given this is a virgin territory without previous experience in exploratory activity.

In fact this is an illustration of the problem quite possibly inherent in the "regional EIS" -- too sketchy and diffuse to adequately recognize major differences within the region.

33-2 2. Onshore impacts. The mitigation role claimed to assist local government planning and accommodation to associated onshore activities may be (is likely to be?) entirely outdated based on current Administration budget proposal, which would stop the CEIP assistance for planning relied upon in this DEIS (p. 253).

33-3 3. Question of adequate fresh water supply from Florida for Florida Shelf activity: I haven't the information from these Florida counties to confirm availability of the fresh water estimates of need during exploration (2-5 rigs per year, at rate of 26 million gallons per rig per year). Furthermore no estimate is given of the water requirements for the sweetening process to be expected in connection with the storage facilities listed as possible to be located on Florida coast.

Water supply is already a problem in Hillsborough areas. Add cyclic droughts and OCS needs and water supply could be a problem not recognized here?

33-4 4. Solid wastes disposal on land is barely mentioned -- except to indicate amounts would be minor. We point out however that disposal of toxic materials is always a problem, that Florida is only beginning to explore ways and means of disposal. With the state's hydrology, landfills are always a problem, and the nature and disposal of these non-sanitary wastes needs careful predictive planning.

33-5 5. The document contradicts itself regarding new facilities. On one hand, "construction of one to two pipelines and one to two storage facilities in eastern Gulf" are conceded to be possible (p. 217, 229). On the other hand, most of the discussion reiterates "no new facilities should occur anywhere" -- pp. 233, 253 etc. This makes a difference regarding air quality and estuaries for instance.

33-6 6. Air quality changes due to presence of storage facilities, hydrocarbon "sweetening", and hydrocarbon cargo transfer are not addressed -- and they are all important (p. 227).

33-7 7. Estuary impacts are not addressed associated with hydrocarbon carriers from harbors (where storage would be likely) and which are more than likely located in estuarine areas.

33-8 8. "Pipeline along the coast of Florida" is indicated as a possible need -- but I did not find any clarification of where "along the coast" is -- outside state waters? in state waters? through coastal marshes? It would be of great concern where and how.

33-9 9. Fish habitat and coastal marsh impacts from oil spill are passed over much too lightly. In fact Louisiana marshes are not the only ones likely to be affected. Surely the non-beach----low energy Big Bend coast of Florida is at risk from wind and current-driven oil during the counter-clockwise current season in the Gulf that would move oil from south to north. With oil that drifts into Big Bend marshes and low energy wave action, cleaning time of marshes would be of a long time period.

33-10 10. Prediction of oil spills being highest off Florida (lacking a pipeline) needs to be recognized for the danger it is -- and for the fact that the US still lacks adequate oil spill protection legislation that provides damage coverage to property owners. In addition, current bill in Congress would supercede and render ineffective Florida's oil spill legislation.

33-11 11. Regarding disposal of drilling fluids, cuttings, and formation waters, has a scientific test yet been carried out (on terms agreeable to both industry and scientific community) on which to base decisions for where to shunt, to transport, to dump?

33-12 12. Regarding coastal canals through marshes, surely this is the humorous understatement of the year "Louisiana marsh canals have been known to persist for years and may even enlarge"! (emphasis added). Consider that the loss of Louisiana marsh has accelerated to a much higher average loss than previously estimated-- around 40 sq. mi. yearly!

Sincerely,

Shirley Taylor

Shirley Taylor for Florida Chapter Sierra Club
Chair, Sierra Club National Coastal Committee

ST:mh

32-1 It must be pointed out that the Florida offshore area in the Gulf of Mexico is not "virgin territory without previous experience in exploratory activity." In fact, Florida's offshore drilling history dates back to 1947 when the first offshore exploratory well was drilled from an artificially created island located 30 miles west of Key West. Since that time more than 30 wells have been drilled in the coastal and offshore waters of the eastern Gulf of Mexico. There have been three OCS lease sales affecting the Florida offshore area. OCS Sale 32 (1974) resulted in 12 exploratory wells being drilled in four areas of the eastern Gulf of Mexico: the Destin Dome anticline southwest of Panama City (8 wells completed); the Middle Grounds area (1 well completed); the area 60 miles south of Pensacola (1 well completed); and the area west of Pinellas County in the Clearwater Field (2 wells completed). More recently, as a result of OCS Sales 41 (1976) and 65 (1979) exploratory drilling is either in progress or planned on seven tracts 80-120 miles offshore of Sarasota County-Charlotte Harbor area.

Detailed environmental analyses were accomplished in conjunction with these sales. Environmental impact statements were prepared for each sale and were the subject of extensive public review and comment.

Experience to date with exploration activity in the Florida Shelf area indicates these operations have had (and are having) a negligible adverse impact on the offshore and coastal environments.

It is believed that the "resource analysis" for the eastern Gulf of Mexico summarized in the DEIS is sufficient to support an informed decision among the proposed alternative actions. Information is given on the amount, location, and other relevant characteristics of major "impact producing factors" which could affect the offshore and coastal environments. Major/significant environmental concerns (as well as others not so identified) were assessed with respect to relevant impact producing factors, and findings made on the probability or risk of an interaction or conflict occurring; the probability or risk of a significant adverse impact resulting, given an interaction; and the expected impact or loss from the proposed sales. This information is described in Section IV and Appendix B of the DEIS.

It should be pointed out that CEQ's final regulations required the length of EIS's be reduced (and page limits set) by avoiding encyclopedic discussions; discussing only briefly the concerns/issues not identified as major or significant; emphasizing material useful to decisionmakers; reducing background material; and incorporating by reference. To comply with these requirements for a Gulfwide EIS such as prepared for Sales 67 and 69, it is necessary that descriptions, discussions, and analyses be general or in summary form in many instances and be limited to concerns/issues identified through the scoping process. As a result of this reduction process, it is expected that some reviewers of the DEIS will feel that certain topics have not received sufficient attention.

32-2 Thank you for your comment. The text has been changed to reflect the uncertainty of future funding for CZM programs.

32-3 Potential processing facilities for hydrocarbon "sweetening," if needed, might be accomplished offshore or onshore. If located onshore the partial processing facility could be sited at or near the marine terminal and storage facilities used for transshipment of the hydrocarbons. Partial processing facilities require only a small volume of water, about 10,000 gallons a month according to the NERBC-RALI Factbook (November 1976).

32-4 Thank you for your comment. Please see our response to Comment 13-36.

32-5 Thank you for your comment. The possibility exists that oil and gas activities resulting from these sales could lead to the construction of 1-2 onshore processing and storage facilities and 1-2 pipeline landfalls in the eastern Gulf of Mexico.

32-6 Thank you for your comment. The possibility that these sales could lead to the construction of 1-2 onshore processing and storage facilities and 1-2 pipeline landfalls in the eastern Gulf of Mexico warrants consideration. Changes in local air quality (onshore) from placement of processing or storage facilities would likely occur if these facilities were constructed; however, the impact on air quality from these facilities would be minimal since onshore emissions and local air quality are regulated to the extent that emissions are controlled to a level that will enhance or minimize the effect on local attainment status. The permitting of such facilities is contingent upon meeting air quality standards.

32-7 Impacts on estuaries by hydrocarbons from carriers and/or storage facilities would be similar to the ones detailed in the DEIS in Appendix B (Summary Impact Assessment) of the DEIS on pages 224-225, 230-231, and 236-237.

32-8 Could "Pipeline along the coast of Florida" be out of context? Words of a similar nature are found on page 107 of the DEIS for Sales 67 and 69. See Section IV.B.2.b.(4) where the words – "Production . . . a trunk *pipeline* with landfalls *along the* west coast of *Florida.*" – are found.

A pipeline constructed to transport hydrocarbons or other mineral substances produced on the OCS of Florida will, by placement, originate outside of state waters. Where landfall for a pipeline from the shelf area would occur is problematical. Until there is production of some identifiable commodity from development of the Florida shelf, the where, of coastal impacts is a speculative assumption; however, similar concerns related to the Louisiana/Texas coasts have been documented.

How? If this refers to construction of production and transmission capabilities, they are amply documented in construction reports. Otherwise, the commentor must be more specific.

32-9 We believe that impacts from oil spills on fish habitat and coastal marshes have been adequately treated in the DEIS and in its Appendix B, as evidenced by the lack of negative comments on this subject from such agencies as NMFS, FWS, EPA, the Louisiana Department of Wildlife and Fisheries, and the Mississippi Department of Wildlife Conservation.

32-10 Measures for avoidance, containment, and cleanup of oil spills are discussed in Section I.C.3. of the EIS. Compensation for injury, destruction, or loss of use of real or personal property is presently available through the Offshore Oil Spill Pollution Fund, in accordance with the terms of Title III of the OCS Lands Act Amendments of 1978. Additionally, cleanup and compensation for spills of oil and hazardous substances is included in the Comprehensive Oil Pollution Liability and Compensation Act presently before Congress (H.R. 85).

32-11 As is mentioned in the DEIS, numerous studies have been carried out by both BLM and industry, as well as other federal agencies, which support our contention that our requirements regarding shunting are indeed working. There is some controversy regarding these interpretations, but that is the nature of the regulatory process. However, EPA, one of our critics on this matter, has contracted an independent review of the muds and cuttings discharge issue, and a draft report now in review seems to support our conclusions. We look forward to the publication of the final report.

32-12 The comment regarding the effects of canals in Louisiana's coastal marshes contains an incomplete quotation and is also taken out of context. On pages 234 and 235 of the DEIS (Appendix B, Summary Impact Assessment), under facilities construction, land-use alteration, and space-use competition, the resulting impacts to nursery grounds are summarized. In those portions of the Gulf of Mexico where a pipeline would not make landfall in marshes, environmental damage to nursery areas would be severe but short-term. The DEIS continues on page 235 as follows: "However, in coastal Louisiana marshes, canals for transportation and pipeline emplacement are known to persist for years and may even enlarge due to natural processes." This sentence, far from the "humorous understatement of the year" that your comment considers it to be, contrasts the serious and long-term environmental damage pipeline emplacement in Louisiana's marshes causes with the much less serious and short-term disruptions of coastal habitat where beaches, dunes, and ecosystems other than marshes are concerned. We believe that viewed in its correct context this sentence accurately reflects the potential impacts on Louisiana's marshes due to new pipeline emplacement in the unlikely event that this should become necessary. Also, please see Section IV.C.5. for a discussion of marsh loss in the Louisiana Coastal Region.

Undoubtedly, you are aware of the fact that any new pipeline construction in coastal regions has to be permitted by the U.S. Army Corps of Engineers and applicable state and local agencies. The fact that an OCS oil and gas lease sale is being proposed does not, in itself, constitute an automatic loss of wetlands. Site-specific environmental assessments and/or environmental impact statements will further provide a forum for public dialogue and participation in the decisionmaking process if actual pipeline construction is contemplated.

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VI

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These references cited are available for review by the public in the BLM New Orleans OCS Office library. Most of these references may also be found in public or university libraries. The New Orleans OCS Office library will, upon request, provide assistance to anyone having difficulty locating any of these publications.

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Section VIII

Appendices

VIII

Appendix A

Proposed Tract List

APPENDIX A

PROPOSED TRACT LIST
SALE 67

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SOUTH PADRE ISLAND AREA, EAST ADDITION						
67-1	A-72	All	(G)	5760	36	50
67-2	A-73	All	(G)	5760	35	50
67-3	A-83	All	(G)	5760	35	50
NORTH PADRE ISLAND AREA						
67-4	919	1/	(G)	2630 est.	9	26
67-5	924	1/	(G)	2747 est.	9	27
NORTH PADRE ISLAND AREA, EAST ADDITION						
67-6	A-12	All	(G)	5760	40	75
67-7	A-13	All	(G)	5760	42	80
MUSTANG ISLAND AREA, EAST ADDITION						
67-8	733	All	(G)	5361.5	31	50
67-9	734	All	(G)	5329.26	33	53
67-10	A-58	All	(G)	5296.87	35	56
67-11	A-59	All	(G)	5760	35	58
67-12	A-60	All	(G)	5760	37	62
67-13	A-151	All	(G)	5760	44	85
67-14	A-152	All	(G)	5760	45	90
67-15	A-153	All	(G)	5760	47	95
67-16	A-162	All	(G)	5760	49	100
MATAGORDA ISLAND AREA						
67-17	569	All	(G)	5760	20	24
67-18	586	All	(G)	5760	22	27
67-19	587	All	(G)	5760	20	26
67-20	588	All	(G)	5760	19	25
67-21	589	All	(G)	5760	15	25
67-22	603	All	(G)	5760	15	25
67-23	622	All	(G)	5760	15	25
67-24	636	All	(G)	5760	17	27
67-25	718	2/	(G)	4970 est.	10	22
BRAZOS AREA						
67-26	412	All	(G)	5760	11	20

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
BRAZOS AREA, SOUTH ADDITION						
67-27	A-49	All	(G)	5760	39	45
67-28	A-50	All	(G)	5760	40	46
67-29	A-68	All	(G)	5760	42	49
GALVESTON AREA						
67-30	257	All	(G+O)	5760	22	16
HIGH ISLAND AREA						
67-31	20	2/	(G)	3450 est.	9	11
67-32	22	2/	(G)	1705 est.	10	11
HIGH ISLAND AREA, EAST ADDITION						
67-33	83	All	(G)	1485.82	23	14
67-34	120	All	(G)	2925.12	26	14
67-35	128	All	(G)	4364.41	29	14
67-36	A-244	All	(G)	2913.80	76	35
67-37	A-245	All	(G)	4353.09	79	36
HIGH ISLAND AREA, SOUTH ADDITION						
67-38	A-565	All	(G)	5760	89	90
67-39	A-579	All	(G)	5760	90	110
67-40	A-580	All	(G)	5760	91	120
WEST CAMERON AREA						
67-41	112	All	(G)	5000	17	12
67-42	114	All	(G)	5000	18	8
67-43	130	All	(G)	5000	20	11
67-44	283	All	(G)	5000	63	30
67-45	284	All	(G)	5000	62	30
WEST CAMERON AREA, WEST ADDITION						
67-46	379	All	(G)	5000	60	21
67-47	380	All	(G)	5000	62	20
WEST CAMERON AREA, SOUTH ADDITION						
67-48	470	All	(G)	3186.36	77	38
67-49	471	All	(G)	2282.36	80	37
67-50	529	All	(G)	5000	89	54
67-51	530	All	(G)	5000	88	52

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
EAST CAMERON AREA						
67-52	29	All	(G)	5000	13	13
67-53	30	All	(G)	5000	12	13
67-54	44	All	(G)	5000	13	14
67-55	86	All	(G)	5000	25	18
67-56	87	All	(G)	5000	24	18
67-57	191	All	(G)	5000	59	28
67-58	206	All	(G)	5000	60	31
EAST CAMERON AREA, SOUTH ADDITION						
67-59	260	All	(G)	5000	76	47
67-60	339	All	(G)	5000	100	84
VERMILION AREA						
67-61	17	3/	(G)	1723.59 est.	3	8
67-62	44	All	(G)	5000	12	11
67-63	45	All	(G+O)	5000	11	10
67-64	46	S½	(G)	2500	10	9
67-65	47	All	(G)	5000	9	8
67-66	56	All	(G)	5000	13	9
67-67	105	All	(G)	5000	28	18
67-68	145	All	(G)	5000	39	25
67-69	158	All	(G)	5000	42	27
VERMILION AREA, SOUTH ADDITION						
67-70	253	All	(G)	5000	70	46
SOUTH MARSH ISLAND AREA, SOUTH ADDITION						
67-71	77	All	(O)	5000	60	40
67-72	194	All	(G+O)	5000	95	100
67-73	202	All	(G+O)	5000	100	80
67-74	203	All	(G+O)	5000	98	80
SOUTH MARSH ISLAND AREA, NORTH ADDITION						
67-75	248	All	(G)	5000	22	6
67-76	259	All	(G)	5000	24	7
EUGENE ISLAND AREA						
67-77	20	3/	(G)	3582.12 est.	3	3
67-78	21	3/	(G)	4789.31 est.	3	3
67-79	22	3/	(G)	4351.06 est.	3	4
67-80	23	3/	(G)	4691.75 est.	3	5

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
EUGENE ISLAND AREA (cont.)						
67-81	28	All	(G)	5000	12	5
67-82	29	All	(G)	5000	13	5
67-83	30	All	(G)	5000	14	5
67-84	31	All	(G)	5000	15	4
EUGENE ISLAND AREA, SOUTH ADDITION						
67-85	316	All	(G+O)	5000	68	69
SHIP SHOAL AREA						
67-86	37	S½NE¼;NW¼; S½	(G)	4375	5	3
67-87	38	4/	(G)	1400 est.	3	2
SHIP SHOAL AREA, SOUTH ADDITION						
67-88	240	All	(G)	5000	44	41
67-89	259	All	(G)	5141.14	45	44
67-90	321	All	(G)	5000	65	96
SOUTH PELTO AREA						
67-91	16	All	(G+O)	5000	14	17
67-92	24	All	(G+O)	5000	16	18
67-93	25	All	(G+O)	5000	15	18
SOUTH TIMBALIER AREA, SOUTH ADDITION						
67-94	224	All	(G)	5000	45	52
67-95	225	All	(G)	5000	45	54
67-96	314	All	(G)	5000	64	120
WEST DELTA AREA						
67-97	49	All	(G+O)	5000	5	10
67-98	50	3/	(G+O)	2637.37 est.	3	7
SOUTH PASS AREA, SOUTH AND EAST ADDITION						
67-99	75	All	(G+O)	5000	10	105
67-100	83	All	(G+O)	5000	13	140
MAIN PASS AREA						
67-101	118	All	(G+O)	4994.55	24	20
67-102	127	S½	(G+O)	2497.27	20	20

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
MAIN PASS AREA, SOUTH AND EAST ADDITION						
67-103	221	All	(O)	4994.55	69	78
67-104	253	All	(O)	4994.55	70	91
67-105	254	All	(O)	4994.55	72	97
PROTRACTION DIAGRAM, MOBILE NH 16-4						
67-106	778		(G)		6	14
	822	5/		5600	7	16
67-107	779		(G)		6	14
	823				7	15
	824	5/		4150 est.	6	15
67-108	819	5/	(G)	2928	6	15
67-109	820	5/	(G)	3180	6	16
67-110	821	5/	(G)	3400	6	16
67-111	825		(G)		6	10
	826	5/		2820	6	12
67-112	827	5/	(G)	3240 est.	6	14
67-113	828	5/	(G)	3180 est.	6	15
67-114	861	5/	(G)	5040 est.	6	15
67-115	862	5/	(G)	5440 est.	6	16
67-116	864	All	(G)	5760	8	20
67-117	865	All	(G)	5760	8	20
67-118	866	All	(G)	5760	8	19
67-119	867	All	(G)	5760	9	18
67-120	868	All	(G)	5760	9	18
67-121	869	All	(G)	5760	8	19
67-122	870	All	(G)	5760	9	18
67-123	905	All	(G)	5760	9	18
67-124	906	All	(G)	5760	9	18
67-125	908	All	(G)	5760	9	20
67-126	909	All	(G)	5760	9	20
PROTRACTION DIAGRAM, VIOSCA KNOLL NH 16-7						
67-127	565	All	(O)	5197.59	55	70
67-128	825	All	(O)	5760	57	500
67-129	826	All	(O)	5760	59	550
67-130	869	All	(O)	5760	57	600
67-131	870	All	(O)	5760	60	800
67-132	987	All	(G+O)	5760	19	275
PROTRACTION DIAGRAM, EWING BANK NH 15-12						
67-133	481	All	(G+O)	3596.36	45	100
67-134	525	All	(G+O)	2419.57	46	100
67-135	526	All	(G+O)	3516.99	47	120

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
PROTRACTION DIAGRAM, MISSISSIPPI CANYON NH 16-10						
67-136	441	All	(G+O)	5760	45	450
67-137	485	All	(G+O)	5760	47	425
PROTRACTION DIAGRAM, CORPUS CHRISTI NG 14-3						
67-138	567	All	(G)	5760	64	200
67-139	568	All	(G)	5760	66	250
67-140	569	All	(G)	5760	69	300
67-141	570	All	(G)	5760	72	350
67-142	611	All	(G)	5760	65	250
PROTRACTION DIAGRAM, EAST BREAKS NG 15-1						
67-143	244	All	(G+O)	5760	88	350
67-144	245	All	(G+O)	5760	89	450
67-145	288	All	(G+O)	5760	90	400
67-146	289	All	(G+O)	5760	91	400
67-147	292	All	(G+O)	5760	95	350
67-148	293	All	(G+O)	5760	96	450
67-149	336	All	(G+O)	5760	98	550
67-150	337	All	(G+O)	5760	100	550
PROTRACTION DIAGRAM, GARDEN BANKS NG 15-2						
67-151	105	All	(G)	5760	121	200
67-152	106	All	(G)	5760	120	200
67-153	149	All	(G)	5760	124	200
67-154	150	All	(G)	5760	124	70
67-155	158	All	(G)	5760	119	350
67-156	159	All	(G)	5760	119	300
67-157	169	All	(G)	5760	115	350
67-158	170	All	(G)	5760	114	350
67-159	213	All	(G)	5760	116	250
67-160	214	All	(G)	5760	115	400
PROTRACTION DIAGRAM, GREEN CANYON NG 15-3						
67-161	97	All	(G)	5760	90	300
67-162	98	All	(G)	5760	88	350
67-163	142	All	(G)	5760	91	500
67-164	143	All	(G)	5760	90	400
67-165	152	All	(G)	5760	85	500
67-166	153	All	(G)	5760	84	650
67-167	154	All	(G)	5760	84	450
67-168	198	All	(G)	5760	87	750
67-169	199	All	(G)	5760	87	700
67-170	427	All	(G)	5760	103	1150
67-171	428	All	(G)	5760	103	1100
67-172	471	All	(G)	5760	106	1200
67-173	472	All	(G)	5760	106	1200
67-174	515	All	(G)	5760	109	1250
67-175	516	All	(G)	5760	109	1200

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
PROTRACTION DIAGRAM, ST. PETERSBURG NG 17-1						
67-176	620	All	(O)	5760	69	56
67-177	662	All	(O)	5760	75	68
67-178	663	All	(O)	5760	72	62
67-179	664	All	(O)	5760	69	58
PROTRACTION DIAGRAM, CHARLOTTE HARBOR NG 17-4						
67-180	624	All	(O)	5760	87	66
67-181	625	All	(O)	5760	85	63
67-182	626	All	(O)	5760	82	60
67-183	669	All	(O)	5760	86	64
67-184	670	All	(O)	5760	83	62
67-185	713	All	(O)	5760	86	64
67-186	714	All	(O)	5760	84	64
67-187	757	All	(O)	5760	88	66
67-188	758	All	(O)	5760	85	66
67-189	797	All	(O)	5760	100	86
67-190	798	All	(O)	5760	97	76
67-191	799	All	(O)	5760	94	70
67-192	800	All	(O)	5760	92	56
67-193	801	All	(O)	5760	88	66
67-194	802	All	(O)	5760	86	65
67-195	803	All	(O)	5760	83	63
67-196	841	All	(O)	5760	101	90
67-197	842	All	(O)	5760	98	74
67-198	843	All	(O)	5760	95	66
67-199	844	All	(O)	5760	92	70
67-200	845	All	(O)	5760	89	68
67-201	846	All	(O)	5760	86	65
67-202	847	All	(O)	5760	84	63
67-203	885	All	(O)	5760	102	93
67-204	886	All	(O)	5760	98	77
67-205	887	All	(O)	5760	96	67
67-206	888	All	(O)	5760	93	70
67-207	889	All	(O)	5760	90	68
67-208	890	All	(O)	5760	87	65
67-209	891	All	(O)	5760	85	64
67-210	929	All	(O)	5760	103	93
67-211	930	All	(O)	5760	99	78
67-212	931	All	(O)	5760	97	68
67-213	932	All	(O)	5760	94	70
67-214	933	All	(O)	5760	91	68
67-215	934	All	(O)	5760	88	65
67-216	935	All	(O)	5760	86	65
67-217	973	All	(O)	5760	103	82
67-218	974	All	(O)	5760	101	79
67-219	975	All	(O)	5760	98	75
67-220	976	All	(O)	5760	95	72

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
PROTRACTION DIAGRAM, CHARLOTTE HARBOR NG 17-4 (cont.)						
67-221	977	All	(O)	5760	92	70
67-222	978	All	(O)	5760	88	68
67-223	979	All	(O)	5760	87	64

Tract	Former Tract No. (A66/66)	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
HIGH ISLAND AREA, EAST ADDITION, SOUTH EXTENSION							
67-224	A66-213	A-374	All	(G)	5760	102	115
67-225	A66-214	A-385	All	(G)	5760	98	110

1/ That portion of the lease block seaward of the Three Marine League Line measured from the historic shoreline described in the United States vs. Louisiana, No. 9 Original (394 U.S. 836).

2/ That portion of the lease block seaward of the Three Marine League Line.

3/ That portion of the lease block which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, June 16, 1975 (United States vs. Louisiana, 422 U.S. 13).

4/ That portion of the lease block which is more than three geographical miles seaward from the line described in the supplemental decree of the U.S. Supreme Court, June 16, 1975 (United States vs. Louisiana, 422 U.S. 13) excluding any state leases.

5/ That portion of the lease block which is more than three geographical miles seaward from the low water line off the coast of Mississippi and/or Alabama.

PROPOSED TRACT LIST
SALE 69

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
SOUTH PADRE ISLAND AREA						
69-1	1027	1/	(G)	1615 est.	9	28
69-2	1028	All	(G)	5760	12	31
69-3	1043		(G)		9	30
	1044	1/		5525 est.	9	26
69-4	1049	1/	(G)	3715 est.	9	28
69-5	1063	All	(G)	5760	11	31
69-6	1064	1/	(G)	2145 est.	9	27
69-7	1069	1/	(G)	555 est.	9	27
69-8	1070	1/	(G)	5745 est.	9	30
NORTH PADRE ISLAND AREA						
69-9	949	All	(G)	5760	30	45
69-10	954	All	(G)	5760	24	45
69-11	999	All	(G)	5760	16	34
69-12	1000	All	(G)	5760	11	31
69-13	1007	1/	(G)	5490 est.	9	30
69-14	1008	All	(G)	5760	11	33
69-15	1021	All	(G)	5760	11	33
69-16	1022	1/	(G)	3685 est.	9	28
MUSTANG ISLAND AREA						
69-17	A-2	All	(G)	5760	34	58
69-18	A-15	All	(G)	5760	41	74
69-19	A-17	All	(G)	5760	45	86
69-20	A-18	All	(G)	5760	44	78
69-21	A-25	All	(G)	5760	43	82
MATAGORDA ISLAND AREA						
69-22	518	1/	(G)	5695 est.	10	20
69-23	666	All	(G)	5760	16	26
69-24	682	All	(G)	5760	25	38
69-25	688	All	(G)	5760	13	24
69-26	A-3	All	(G)	5760	25	58
BRAZOS AREA						
69-27	517	All	(G)	5760	14	21
69-28	577	All	(G)	5760	28	34
69-29	A-15	All	(G)	5760	42	46
69-30	A-16	All	(G)	5760	41	44

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
BRAZOS AREA, SOUTH ADDITION						
69-31	A-73	All	(G)	5760	32	44
69-32	A-74	All	(G)	5760	34	47
GALVESTON AREA						
69-33	151	2/	(G)	2610 est.	10	15
69-34	181	All	(G)	5760	12	16
69-35	189	3/	(G+O)	1850 est.	9	16
69-36	A-3	All	(G)	5760	34	22
69-37	A-10	All	(G)	5760	35	27
HIGH ISLAND AREA, EAST ADDITION						
69-38	45	All	(G)	4367.24	17	10
69-39	A-184	All	(G)	2920.87	45	20
HIGH ISLAND AREA, SOUTH ADDITION						
69-40	A-577	All	(G)	5760	98	95
69-41	A-592	All	(G)	5760	100	110
69-42	A-593	All	(G)	5760	102	110
HIGH ISLAND AREA, EAST ADDITION, SOUTH EXTENSION						
69-43	A-295	All	(G)	5760	96	60
69-44	A-296	All	(G)	5760	95	60
69-45	A-306	All	(G)	5760	98	63
69-46	A-308	All	(G)	5760	99	64
WEST CAMERON AREA						
69-47	202	All	(G)	5000	33	18
69-48	236	All	(G)	5000	39	21
69-49	248	All	(G)	5000	44	23
69-50	250	All	(G)	5000	41	22
69-51	252	All	(G)	5000	45	23
WEST CAMERON AREA, WEST ADDITION						
69-52	338	All	(G)	4034.34	44	20
WEST CAMERON AREA, SOUTH ADDITION						
69-53	466	All	(G)	5000	81	38
69-54	474	All	(G)	5000	83	40
69-55	475	All	(G)	5000	84	41

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
WEST CAMERON AREA, SOUTH ADDITION (cont.)						
69-56	566	All	(G)	5000	101	60
69-57	570	All	(G)	5000	104	60
69-58	588	All	(G)	5000	106	70
EAST CAMERON AREA						
69-59	35	All	(G)	5000	7	11
69-60	36	All	(G)	5000	6	11
69-61	230	All	(G)	5000	68	36
EAST CAMERON AREA, SOUTH ADDITION						
69-62	241	All	(G)	5000	71	40
69-63	242	All	(G)	5000	71	39
69-64	303	All	(G+O)	5000	89	60
VERMILION AREA						
69-65	32	All	(G)	5000	7	6
69-66	70	All	(G)	5000	15	6
69-67	114	All	(G)	5000	29	16
69-68	115	All	(G)	5000	29	17
69-69	116	All	(G)	5000	30	18
69-70	128	All	(G)	5000	32	20
69-71	129	All	(G)	5000	32	20
69-72	225	W½NE¼;W½; NW¼SE¼;S½SE¼	(G)	4062.50	60	36
69-73	226	NE¼NE¼;E½NW¼ NE¼;S½NE¼E½SE¼NW¼; E½NE¼SW¼;S½SW¼;SE¼	(G)	3281.25	60	37
VERMILION AREA, SOUTH ADDITION						
69-74	332	All	(G+O)	5000	88	65
SOUTH MARSH ISLAND AREA						
69-75	19	All	(G+O)	5000	40	22
69-76	20	All	(G+O)	5000	39	21
SOUTH MARSH ISLAND AREA, SOUTH ADDITION						
69-77	147	All	(G)	5000	87	52
69-78	158	All	(G+O)	2715.55	89	78
69-79	159	All	(G+O)	2692.87	91	80
SOUTH MARSH ISLAND AREA, NORTH ADDITION						
69-80	280	All	(G+O)	5000	28	12

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
EUGENE ISLAND AREA						
69-81	83	All	(G)	5000	14	7
69-82	84	All	(G)	5000	15	7
EUGENE ISLAND AREA, SOUTH ADDITION						
69-83	298	All	(G+O)	5000	60	62
69-84	347	All	(G)	5000	70	100
69-85	393	All	(G)	5000	92	114
SHIP SHOAL AREA						
69-86	134	All	(G+O)	5000	22	12
69-87	164	All	(G)	4981.68	26	17
69-88	188	All	(G)	5027.24	32	22
69-89	210	All	(G)	5000	35	28
69-90	211	All	(G)	5050.02	35	27
SHIP SHOAL AREA, SOUTH ADDITION						
69-91	356	All	(G)	5000	69	140
SOUTH TIMBALIER AREA						
69-92	94	All	(G)	5000	24	17
SOUTH TIMBALIER AREA, SOUTH ADDITION						
69-93	251	All	(G)	5000	50	60
69-94	262	All	(G)	5000	63	74
69-95	263	All	(G)	5000	63	70
69-96	264	All	(G)	5000	63	68
69-97	266	All	(G)	3772.18	64	62
GRAND ISLE AREA						
69-98	62	All	(G)	4539.89	16	37
69-99	73	All	(G)	4539.89	21	39
WEST DELTA AREA, SOUTH ADDITION						
69-100	113	All	(G+O)	5000	15	82
69-101	123	All	(G+O)	5000	18	85
69-102	124	All	(G+O)	5000	16	88
MAIN PASS AREA						
69-103	86	All	(G)	4994.55	40	20
69-104	87	All	(G)	4994.55	38	20
69-105	88	All	(G)	4994.55	37	19

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
MAIN PASS AREA (cont.)						
69-106	89	All	(G)	4994.55	35	18
69-107	90	All	(G)	4994.55	30	17
69-108	94	All	(G)	4994.55	33	18
69-109	95	All	(G)	4994.55	35	19
69-110	96	All	(G)	4994.55	37	20
69-111	97	All	(G)	4994.55	39	20
69-112	101	All	(G)	4994.55	31	17
69-113	146	All	(G+O)	4560.81	13	60
69-114	149	All	(G+O)	4999.96	12	67
MAIN PASS AREA, SOUTH AND EAST ADDITION						
69-115	158	All	(G)	4994.55	48	40
69-116	160	All	(G)	4994.55	46	39
69-117	161	All	(G)	4994.55	43	38
69-118	162	All	(G)	4994.55	42	39
69-119	163	All	(G)	4994.55	42	40
69-120	308	All	(G+O)	4999.96	25	100
PROTRACTION DIAGRAM, PENSACOLA NH 16-5						
69-121	926	All	(G)	5760	13	22
69-122	927	All	(G)	5760	13	23
69-123	929	All	(G)	5760	15	25
69-124	970	All	(G)	5760	16	26
69-125	972	All	(G)	5760	17	27
PROTRACTION DIAGRAM, VIOSCA KNOLL NH 16-7						
69-126	814	All	(G+O)	577.44	26	160
69-127	815	All	(G+O)	5278.75	27	160
PROTRACTION DIAGRAM, DESTIN DOME NH 16-8						
69-128	2	All	(G)	5760	19	31
69-129	3	All	(G)	5760	20	32
69-130	4	All	(G)	5760	21	30
69-131	5	All	(G)	5760	21	31
PROTRACTION DIAGRAM, MISSISSIPPI CANYON NH 16-10						
69-132	310	All	(G+O)	5760	35	350
69-133	662	All	(G+O)	5760	52	350
69-134	663	All	(G+O)	5760	50	400
69-135	706	All	(G+O)	5760	55	350
69-136	707	All	(G+O)	5760	53	400
69-137	750	All	(G+O)	5760	57	375
69-138	751	All	(G+O)	5760	56	450

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
PROTRACTION DIAGRAM, GARDEN BANKS NG 15-2						
69-139	286	All	(G)	5760	120	350
69-140	287	All	(G)	5760	120	500
69-141	327	All	(G)	5760	134	300
69-142	328	All	(G)	5760	133	400
69-143	330	All	(G)	5760	133	735
69-144	371	All	(G)	5760	137	450
69-145	372	All	(G)	5760	136	500
69-146	416	All	(G)	5760	140	650
60-147	417	All	(G)	5760	139	800
PROTRACTION DIAGRAM, GREEN CANYON NG 15-3						
69-148	104	All	(G)	5760	84	350
69-149	105	All	(G)	5760	83	500
69-150	914	All	(G)	5760	136	2250
69-151	915	All	(G)	5760	136	2300
69-152	958	All	(G)	5760	138	2250
69-153	959	All	(G)	5760	140	2400
PROTRACTION DIAGRAM, PORT ISABEL NG 14-6						
69-154	33	All	(G)	5760	60	350
69-155	77	All	(G)	5760	59	350
69-156	120	All	(G)	5760	56	250
69-157	121	All	(G)	5760	59	350
69-158	164	All	(G)	5760	55	250
PROTRACTION DIAGRAM, NG 16-6						
69-159	479	All	(O)	5760	112	130
69-160	480	All	(O)	5122.89	110	123
69-161	522	All	(O)	5760	116	140
69-162	523	All	(O)	5760	114	132
69-163	524	All	(O)	5392.11	112	127
69-164	566	All	(O)	5760	116	140
69-165	657	All	(O)	437.27	114	128
69-166	696	All	(O)	5760	125	160
69-167	698	All	(O)	5760	119	148
69-168	699	All	(O)	5760	116	140
69-169	700	All	(O)	5760	114	130
69-170	701	All	(O)	704.83	112	127
69-171	740	All	(O)	5760	125	162
69-172	741	All	(O)	5760	123	158
69-173	742	All	(O)	5760	120	148
69-174	743	All	(O)	5760	117	140
69-175	744	All	(O)	5760	115	130
69-176	745	All	(O)	971.98	113	128
69-177	785	All	(O)	5760	125	158
69-178	786	All	(O)	5760	122	150

PROTRACTION DIAGRAM, NG 16-6 (cont.)

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
69-179	787	All	(O)	5760	118	140
69-180	788	All	(O)	5760	115	133
69-181	789	All	(O)	1238.72	113	128
69-182	829	All	(O)	5760	125	158
69-183	830	All	(O)	5760	122	150
69-184	831	All	(O)	5760	119	142
69-185	832	All	(O)	5760	116	128
69-186	833	All	(O)	1505.05	114	122
69-187	875	All	(O)	5760	120	142
69-188	876	All	(O)	5760	116	136
69-189	877	All	(O)	1770.97	114	130
69-190	921	All	(O)	2036.47	115	130

PROTRACTION DIAGRAM, CHARLOTTE HARBOR NG 17-4

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
69-191	311	All	(O)	5760	92	88
69-192	312	All	(O)	5760	90	82
69-193	313	All	(O)	5760	87	78
69-194	354	All	(O)	5760	96	100
69-195	355	All	(O)	5760	93	88
69-196	356	All	(O)	5760	91	84
69-197	357	All	(O)	5760	88	78
69-198	441	All	(O)	5760	101	118
69-199	442	All	(O)	5760	98	106
69-200	443	All	(O)	5760	96	92
69-201	485	All	(O)	5760	102	120
69-202	486	All	(O)	5760	100	112
69-203	487	All	(O)	5760	97	100
69-204	529	All	(O)	5760	103	120
69-205	530	All	(O)	5760	101	112
69-206	531	All	(O)	5760	98	100
69-207	532	All	(O)	5760	95	94
69-208	573	All	(O)	5760	104	120
69-209	574	All	(O)	5760	102	114
69-210	575	All	(O)	5760	100	100
69-211	576	All	(O)	5760	97	91
69-212	617	All	(O)	5760	105	122
69-213	618	All	(O)	5760	103	115
69-214	619	All	(O)	5760	101	104
69-215	620	All	(O)	5760	98	92
69-216	661	All	(O)	5760	109	122
69-217	662	All	(O)	5760	106	114
69-218	663	All	(O)	5760	103	106
69-219	664	All	(O)	5760	101	94
69-220	705	All	(O)	5760	111	124
69-221	706	All	(O)	5760	109	115

Tract	Block	Description	Reserve	Acreage	Distance From Shore (nmi)	Water Depth (m)
PROTRACTION DIAGRAM, CHARLOTTE HARBOR NG 17-4 (cont.)						
69-222	707	All	(O)	5760	106	106
69-223	708	All	(O)	5760	102	96
69-224	749	All	(O)	5760	111	126
69-225	750	All	(O)	5760	109	114
69-226	751	All	(O)	5760	106	104
69-227	752	All	(O)	5760	104	96
69-228	793	All	(O)	5760	113	126
69-229	794	All	(O)	5760	111	116
69-230	795	All	(O)	5760	107	104
69-231	796	All	(O)	5760	104	94
69-232	837	All	(O)	5760	114	126
69-233	838	All	(O)	5760	112	116
69-234	839	All	(O)	5760	108	106
69-235	840	All	(O)	5760	105	94
69-236	881	All	(O)	5760	115	128
69-237	882	All	(O)	5760	112	116
69-238	883	All	(O)	5760	107	106
69-239	884	All	(O)	5760	105	92
69-240	925	All	(O)	5760	115	128
69-241	926	All	(O)	5760	113	116
69-242	927	All	(O)	5760	110	104
69-243	928	All	(O)	5760	107	96
69-244	969	All	(O)	5760	116	128
69-245	970	All	(O)	5760	114	116
69-246	971	All	(O)	5760	110	106
69-247	972	All	(O)	5760	106	96

1/ That portion of the lease ablock seaward of the Three Marine League Line.

2/ That portion of the lease block seaward of the Three Marine Leagure Line measured from the historic shoreline described in the United States vs. Louisiana, No. 9 Original (394 U.S. 836).

3/ That portion of the lease block seaward of the Three Marine League Line, excluding the SE¼.

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Alternatives Including The Proposed Action II
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I The Proposal
II Alternatives Including The Proposed Action
III Affected Environment
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U.S. Department of the Interior. As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

U.S. Department of the Interior
Bureau of Land Management